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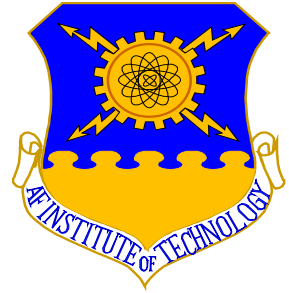
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# **Air Force Institute of Technology**

## **Research Report 2009**

Period of Report: 1 October 2008 to 30 September 2009

Graduate School of Engineering and Management

**GRADUATE SCHOOL OF ENGINEERING AND MANAGEMENT  
AIR FORCE INSTITUTE OF TECHNOLOGY  
WRIGHT-PATTERSON AIR FORCE BASE, OHIO**

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# **AIR FORCE INSTITUTE OF TECHNOLOGY**

Wright-Patterson Air Force Base, Ohio

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This report was edited and produced by the Office of Research and Sponsored Programs, Graduate School of Engineering and Management, Air Force Institute of Technology. The Department of Defense, other federal government, and non-government agencies supported the work reported herein but have not reviewed or endorsed the contents of this report.

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or visit the AFIT website: [www.afit.edu](http://www.afit.edu)



## Air Force Institute of Technology Research Report 2009 Foreword

Research is the cornerstone of the dramatic advances in air, space, and cyber technology that underpin the nation's ability to meet the international and homeland security challenges of tomorrow. Research is also an integral part of graduate education, providing graduates with in-depth knowledge, critical thinking skills, and problem solving abilities. At the Air Force Institute of Technology (AFIT), our faculty and students engage in research with the goal of sustaining the technological supremacy of the United States Air Force (USAF) and the Department of Defense (DoD).

AFIT maintains active partnerships with our Air Force's organizations and operational communities as well as the DoD and other federal agencies to maximize the contributions of our research programs to national 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) whenever appropriate.

This Research Report is prepared annually to report on the significant contributions of this institution; to solicit continued involvement and support from our Air Force, DoD, and other federal partners; and to encourage new sponsors to participate in AFIT's research programs. AFIT welcomes new opportunities to engage in research projects that are of mutual interest to our customers, faculty, and students.

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



## Table of Contents

<b>AIR FORCE INSTITUTE OF TECHNOLOGY .....</b>	<b>i</b>
<b>1. INTRODUCTION .....</b>	<b>1</b>
<b>1.1. OVERVIEW.....</b>	<b>1</b>
<b>1.2. THE GRADUATE SCHOOL OF ENGINEERING AND MANAGEMENT RESEARCH COLLABORATION .....</b>	<b>1</b>
<b>2. SPECIAL RECOGNITIONS.....</b>	<b>4</b>
<b>2.1. FACULTY FELLOWS .....</b>	<b>4</b>
<b>2.2. PROFESSIONAL CERTIFICATIONS.....</b>	<b>6</b>
<b>2.3. RESEARCH AND TEACHING AWARDS .....</b>	<b>8</b>
<b>2.3.1. FACULTY .....</b>	<b>8</b>
<b>2.3.2. STUDENTS .....</b>	<b>10</b>
<b>3. RESEARCH STATISTICS.....</b>	<b>13</b>
<b>3.1. RESEARCH ASSESSMENT QUESTIONNAIRE RESULTS .....</b>	<b>13</b>
<b>3.2. RESEARCH AND CONSULTING OUTPUT MEASURES .....</b>	<b>15</b>
<b>3.3. RESEARCH AND CONSULTING SPONSORSHIP.....</b>	<b>16</b>
<b>3.4. OUTSIDE FUNDING FOR THE GRADUATE SCHOOL OF ENGINEERING AND MANAGEMENT .....</b>	<b>18</b>
<b>4. SPONSORSHIP OF STUDENT RESEARCH.....</b>	<b>20</b>
<b>4.1. OFFICE OF THE SECRETARY OF THE AIR FORCE.....</b>	<b>20</b>
<b>4.2. HEADQUARTERS UNITED STATES AIR FORCE.....</b>	<b>20</b>
<b>4.3. AIR FORCE COMMUNICATIONS AGENCY .....</b>	<b>21</b>
<b>4.4. AIR COMBAT COMMAND .....</b>	<b>22</b>
<b>4.5. AIR EDUCATION AND TRAINING COMMAND.....</b>	<b>23</b>
<b>4.6. AIR FORCE MATERIEL COMMAND .....</b>	<b>26</b>
<b>4.7. AIR FORCE SPECIAL OPERATIONS COMMAND .....</b>	<b>38</b>
<b>4.8. AIR MOBILITY COMMAND .....</b>	<b>38</b>
<b>4.9. AIR FORCE SPACE COMMAND.....</b>	<b>39</b>
<b>4.10. USAF FIELD OPERATING AGENCIES.....</b>	<b>39</b>
<b>4.11. PACIFIC AIR FORCES .....</b>	<b>40</b>
<b>4.12. DEPARTMENT OF DEFENSE .....</b>	<b>41</b>
<b>4.13. NON-FEDERAL SPONSORS .....</b>	<b>43</b>
<b>5. ACADEMIC DEPARTMENT PUBLICATIONS AND FUNDING INFORMATION .....</b>	<b>45</b>
<b>5.1. DEPARTMENT OF AERONAUTICS AND ASTRONAUTICS.....</b>	<b>46</b>
<b>5.2. DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING .....</b>	<b>68</b>
<b>5.3. DEPARTMENT OF ENGINEERING PHYSICS.....</b>	<b>109</b>
<b>5.4. DEPARTMENT OF MATHEMATICS AND STATISTICS.....</b>	<b>137</b>
<b>5.5. DEPARTMENT OF OPERATIONAL SCIENCES .....</b>	<b>147</b>
<b>5.6. DEPARTMENT OF SYSTEMS AND ENGINEERING MANAGEMENT.....</b>	<b>170</b>
<b>6. RESEARCH CENTER PUBLICATIONS AND FUNDING INFORMATION.....</b>	<b>190</b>
<b>6.1. ADVANCED NAVIGATION TECHNOLOGY CENTER.....</b>	<b>191</b>
<b>6.2. CENTER FOR DIRECTED ENERGY .....</b>	<b>193</b>
<b>6.3. CENTER FOR CYBERSPACE RESEARCH .....</b>	<b>198</b>
<b>6.4. CENTER FOR MASINT STUDIES AND RESEARCH.....</b>	<b>206</b>
<b>6.5. CENTER FOR OPERATIONAL ANALYSIS.....</b>	<b>211</b>
<b>6.6. CENTER FOR SYSTEMS ENGINEERING .....</b>	<b>221</b>
<b>APPENDICES .....</b>	<b>222</b>
<b>APPENDIX A: POST-DOCTORAL AND OTHER RESEARCH ASSOCIATES CREDENTIALS .....</b>	<b>222</b>
<b>APPENDIX B: SELECTED ACRONYM LIST.....</b>	<b>223</b>
<b>APPENDIX C: INFORMATION FOR OBTAINING A COPY OF A THESIS .....</b>	<b>225</b>

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# 1. INTRODUCTION

## 1.1. OVERVIEW

This Research Report presents the FY09 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 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 [www.afit.edu/directory](http://www.afit.edu/directory).

Additional information on the research programs at AFIT may also be found on the research web home page at <http://www.afit.edu/en/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](mailto:research@afit.edu). The primary points of contact are Dr. Michael J. Caylor, Director of Sponsored Programs, 937-255-3636 x7104, DSN 785-3636 x7104 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 2009-2010 catalog at <http://www.afit.edu/en/docs/AFIT%20Graduate%20Catalog.pdf>, AFIT offers Master's and Doctoral programs in a variety of disciplines through six departments: the Department of Mathematics and Statistics (ENC), the Department of Electrical and Computer Engineering (ENG), the Department of Engineering Physics (ENP), the Department of Operational Sciences (ENS), the Department of Systems and Engineering Management (ENV), and the Department of Aeronautics and Astronautics (ENY). 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 [www.afit.edu/en](http://www.afit.edu/en).

The [Department of Aeronautics and Astronautics](#) 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**  
**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**  
**Reentry Dynamics**  
**Rocket & Space Propulsion**  
**Rotocraft Aeromechanics**  
**Satellite Cluster Dynamics, Navigation, & Control**  
**Spacecraft Dynamics & Control**  
**Turbine Aerodynamics**

The [Department of Electrical and Computer Engineering](#) invites research topic proposals and collaborative suggestions for the Electrical Engineering, Computer Engineering, Computer Science, Cyber Operations, and Cyber Warfare programs, as well as the **Advanced Navigation Technology Center (ANT)** and the **Center for Cyberspace Research (CCR)**. The following list highlights the Department's research specialties:

**Advanced Security-focused Computing Architectures**  
**Artificial Intelligence**  
**Automatic Target Recognition**  
**Communications/Radar**  
**Computer Communication Networks**  
**Cryptography**  
**Cyber Operations and Security**  
**Electromagnetics/Low Observables**  
**Electro-Optics**

**Evolutionary Algorithms**  
**Guidance, Navigation, and Control**  
**Hardware Assurance**  
**Information Visualization**  
**Micro and Nanosystems**  
**Parallel and Distributed Processing**  
**Signal and Image Processing**  
**Software Protection**  
**Wireless Networks**  
**Wireless Sensor Networks**

The [Department of Engineering Physics](#) 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, as well as the **Center for Directed Energy (CDE)** and the **Center for MASINT Studies and Research (CMSR)**. The following list highlights the Department's research specialties within these programs:

**Combating Weapons of Mass Destruction**  
**Computational Physics**  
**Counterproliferation**  
**Directed Energy Weapons**  
**Electronic and Photonic Materials**

**Lasers and Electro-Optics**  
**Nuclear Weapons and Effects**  
**Nuclear Forensics**  
**Remote Sensing and Signature Analysis**  
**Space Weather**

The [Department of Mathematics and Statistics](#) invites research topic proposals and collaborative suggestions for the following research specialties:

**Acoustic Wave Scattering**  
**Category Theory**  
**Optimization**  
**Design of Experiments**  
**Electromagnetics**  
**Categorical Data Analysis**

**Information Fusion**  
**Multiscale Methods**  
**Functional Analysis**  
**Numerical Analysis**  
**Partial Differential Equations**  
**Wavelets**

The [Department of Operational Sciences](#) invites research topic proposals and collaborative suggestions within the areas of Operations Research, Logistics, and Supply Chain Management programs, as well as the **Center for Operational Analysis (COA)**. The following list highlights the Department's research specialties:

**Applied/Multivariate Statistics**  
**Capacity and Queue Modeling**  
**Decision and Risk Analysis**  
**Information Operations/Information Warfare**  
**Inventory Management/Theory**  
**Math Programming and Optimization**  
**Network Modeling**

**Operational Modeling and Simulation**  
**Operational Problems and Heuristic Modeling**  
**Sensor/Classifier Fusion**  
**Space and International Logistics**  
**Space Logistics Modeling**  
**Stochastic Systems Analysis**  
**Supply Chain Management**



The [Department of Systems and Engineering Management](#) is a multidisciplinary department offering graduate degrees in eight 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 21st century 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:

<b>Applied Environmental Sciences</b>	<b>Knowledge and Strategic Information Management</b>
<b>Cost Analysis</b>	<b>Leadership and Management</b>
<b>Crisis Project Management</b>	<b>Multidisciplinary Distributed Cognition</b>
<b>Crisis Engineering Services Management</b>	<b>Nanotoxicity and Pharmacokinetic Modeling</b>
<b>Crisis Knowledge Management</b>	<b>Operational Information Integration</b>
<b>Cyberlaw and Cyberwar</b>	<b>Organizational Change and Theory</b>
<b>Defense Product Development</b>	<b>Organizational Control Center Performance</b>
<b>Ecological Engineering – Constructed Wetlands</b>	<b>Sustainable Development</b>
<b>Economics and Finance</b>	<b>System Dynamics Analysis</b>
<b>Facility and Infrastructure Management</b>	<b>Systems Engineering</b>
<b>Information Assurance and Security</b>	<b>Technology Development and Application</b>

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 educational or research areas of emphasis appears below. Please contact the Centers directly (see Ch. 6) or visit <http://www.afit.edu/research.cfm> for further information.

The [Advanced Navigation Technology \(ANT\) Center](#) is a forward-looking navigation research center seeking to identify and solve tomorrow's most challenging navigation and targeting problems by focusing on three research thrusts: multiple-vehicle autonomous navigation and control, non-GPS precision navigation, and robust GPS navigation.

The [Center for Directed Energy \(CDE\)](#) is dedicated to Air Force and DoD research in high energy lasers (HEL), high power microwaves (HPM), 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 Cyberspace Research \(CCR\)](#) is one of the National Security Agency (NSA) and Department of Homeland Security's designated Centers of Academic Excellence in Information Assurance Education (CAE/IAE). CCR is also a National Science Foundation Cyber Corp institution. CCR's objectives are to provide cutting-edge offensive and defensive research solutions for cyberspace and cyber security applications and produce a cadre of technically educated leaders for the DoD and federal Government. In June 2008, the CCR was designated the Air Force's Cyberspace Technical Center of Excellence.

The [Center for MASINT Studies and Research \(CMSR\)](#) is focused on Air Force and Department of Defense Measurement and Signature Intelligence (MASINT) scientific, technical and operational activities through graduate research programs. CMSR is a national resource for educating a new generation of MASINT professionals.

The [Center for Operational Analysis \(COA\)](#) directs defense relevant research and timely technology transfer in providing approaches and solutions to current and future operational and resource issues while developing critical and forward thinking analysts, managers, and leaders.

The [Air Force Center for Systems Engineering \(AF CSE\)](#) is a directorate within AFIT and is the recognized Center of Excellence for Systems Engineering (SE) within the Air Force (AF) and the US Department of Defense (DoD). The mission of the Center is to shape the future of systems engineering with the goal of improving our ability to deliver war-fighting capabilities. We accomplish this by conceptualizing new processes, practices, tools, and resources through research, education, and consultation.

## 2. SPECIAL RECOGNITIONS

### 2.1. FACULTY FELLOWS

**Badiru, Adedeji B.**, Professor and Head Department of Systems and Engineering Management, Fellow of the Institute of Industrial Engineers, Fellow of the Nigerian Academy of Engineering.

**Bridgman, Charles J.**, Professor Emeritus of Nuclear Engineering, Department of Engineering Physics, Fellow of the American Nuclear Society.

**Elrod, William E.**, Professor Emeritus of Aerospace Engineering, Department of Aeronautics and Astronautics, Fellow of American Society of Mechanical Engineers International.

**Deckro, Richard F.**, Professor of Operations Research, Department of Operational Sciences, Fellow of the Military Operations Research Society.

**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 of Physics, Department of Engineering Physics, Fellow of the American Physical Society.

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

**Mall, Shankar**, Professor of Aerospace Engineering, Department of Aeronautics and Astronautics, Fellow of the American Society of Mechanical Engineers International.

**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.**, Professor of Aerospace Engineering, Department of Aeronautics and Astronautics, Fellow of American Institute of Aeronautics and Astronautics, Fellow of the American Academy of Mechanics and the American Society of Civil Engineers.

**Perram, Glen P.**, Professor of Physics, Department of Engineering Physics, Fellow of the Directed Energy Professional Society.

**Ruggles-Wrenn, Marina B.**, Professor of Aerospace Engineering, Department of Aeronautics and Astronautics, Fellow of the American Society of Mechanical Engineers International.

**Soni, Som R.**, Associate Professor of Systems Engineering, Department of Systems and Engineering Management, Fellow of the American Society for Composites, Associate Fellow of AIAA.

**Terzuoli, Andrew J.**, Associate Professor of Electrical Engineering, Department of Electrical and Computer Engineering, Fellow of the Electromagnetics Academy.

**Thomas, Marlin U.**, Dean, Graduate School of Engineering, Air Force Institute of Technology, Fellow of the Institute of Industrial Engineers, Fellow of the American Society of Quality, Fellow of the Institute for Operations Research and Management Sciences.

**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 American Society of Mechanical Engineers International, Fellow of the Ohio Academy of Science.

## **2.2. PROFESSIONAL CERTIFICATIONS**

**Badiru, Adedeji B.**, Leadership Certificate, University of Tennessee Leadership Institute

**Badiru, Adedeji B.**, Professional Engineer, State of Oklahoma

**Baldwin, Rusty O.**, Professional Engineer, State of Ohio

**Baldwin, Rusty O.**, Certified Information Systems Security Professional (CISSP)

**Barelka, Alexander J.**, Certified Project Management Professional (PMP)

**Chrissis, James W.**, Registered Professional Engineer (PE), State of Florida

**Coutu, Ronald A., Jr.**, Professional Engineer, State of California

**Cunningham, William A. III**, Certified Transportation and Logistics (CTL) by the American Society of Transportation and Logistics (AST&L)

**Goltz, Mark N.**, Hazardous Waste Management Specialty Certification as a Diplomate Environmental Engineer, American Academy of Environmental Engineers

**Goltz, Mark N.**, Professional Engineer, State of Minnesota

**Goltz, Mark N.**, Board Certified Environmental Engineer, American Academy of Environmental Engineers

**Greendyke, Robert B.**, Professional Engineer, State of Texas

**Grimaila, Michael R.**, Certified Information Security Manager (CISM); Information Systems Audit and Control Association (ISACA); Rolling Meadows, IL

**Grimaila, Michael R.**, Certified Information System Security Professional (CISSP); International Information Systems Security Certification Consortium, Inc. (ISC)2; Vienna, VA

**Harmon, Frederick G.**, Professional Engineer, State of New Hampshire

**Houpis, Constantine H.**, Professional Engineer, State of Ohio

**Kunz, Donald L.**, Professional Engineer, Commonwealth of Virginia

**Marciniak, Michael A.**, Certified Laser Safety Officer, Board of Laser Safety, Orlando, FL

**Mattioda, Daniel D.**, FAA Airframe and Powerplant License

**Mattioda, Daniel D.**, FCC Ground Radio Operators License with Radar Endorsement

**Mullins, Barry E.**, Professional Engineer, State of Colorado

**Mullins, Barry E.**, Security Essential Certification (GSEC) from SysAdmin, Audit, Network, Security Institute's (SANS) Global Information Assurance Certification (GIAC) Program

**Mullins, Barry E.**, Assessing Wireless Networks (GAWN) certification from the SysAdmin, Audit, Network, Security Institute's (SANS) Global Information Assurance Certification (GIAC) Program

**Mullins, Barry E.**, Certified Incident Handler (GCIH) certification from the SysAdmin, Audit, Network, Security Institute's (SANS) Global Information Assurance Certification (GIAC) Program

**Mullins, Barry E.**, National Security Agency INFOSEC Evaluation Methodology (IEM) Certification

**Mullins, Barry E.**, National Security Agency INFOSEC Assessment Methodology (IAM) Certification

**Palazotto, Anthony N.**, Professional Engineer, State of Ohio

**Perram, Glen P.**, Professional Engineer, State of Ohio

**Quinn, Dennis W.**, Professional Engineer, State of Ohio

**Reeder, Mark F.**, Professional Engineer, State of Ohio

**Slagley, Jeremy M.**, Board Certified Industrial Hygienist, American Academy of Industrial Hygienists

**Strouble, Dennis D.**, Licensed Attorney, State of Texas

**Thomas, Marlin U.**, Professional Engineer, State of Michigan

**Turner, Jason M.**, Certified Usability Analyst (CUA) - Human Factors International; Certified Enterprise Architect (CEA) - Federal Enterprise Architecture Certification Institute

**Wirthlin, Joseph R.**, Certified Systems Engineering Professional (CSEP), APDP SPRDTE Level III, NRO Systems Engineering Certification, Level III, APDP Program Management Level II

## **2.3. RESEARCH AND TEACHING AWARDS**

### **2.3.1. FACULTY**

#### **BADIRU, ADEDEJI B.**

Book-of-the-Month Award for “Handbook of Military Industrial Engineering,” IE Magazine, August 2009.

Blue Dart Award, Commander’s Academic Recognition, Air Education and Training Command, Maxwell Air Force Base, Montgomery, AL, May 22, 2009.

Outstanding Educator Award, Associated Societies Council (ASC) of Dayton, Ohio, 2009.

Wellington Award, Institute of Industrial Engineers, Engineering Economy Division, 2009.

#### **DECKRO, RICHARD F.**

Maj Kevin T. Kennedy, Richard F. Deckro, James T. Moore & Kenneth M. Hopkinson, “Nodal Interdiction,” 77th Military Operations Research Society Symposium, June 2009. Selected as Best Presentation in Working Group 1, Strategic Operations, nominated for the Barchi Prize.

2009 Clayton J. Thomas Award from the Military Operations Research Society at the 77<sup>th</sup> MORS Symposium, Jun 2009, for distinguished service over time to the profession of military operations research, enhancement of the image and substance of military operations research, sustained outstanding performance as a military operations research practitioner, and the extension of individual knowledge and talents to others in the profession.

2009 General Bernard A. Schriever Award, Air Force Institute of Technology, sponsored by the Wright Memorial Chapter of the Air Force Association in recognition of the advancement of aerospace power, technology, doctrine, and the Air Force as a profession.

#### **HALL, SHANE N.**

Excellence in Teaching Award, Southwestern Ohio Council for Higher Education (SOCHE), 2009.

#### **HOLT, DANIEL T.**

US Air Force Academy’s Robert L. Taylor Research Award for 2009.

#### **HOPKINSON, KENNETH M.**

Air Force Institute of Technology Civilian of the Quarter, Category III, 2nd Quarter 2009.

Air Force Institute of Technology EN Civilian of the Quarter, Category III, 4th Quarter 2008.

Air Force Institute of Technology EN Junior Civilian Scientist of the Year 2009.

#### **KIM, YONG C.**

Air Force Outstanding Engineer Award, Mid Career Civilian Category, Air Force Science, Technology, Engineering and Mathematics (STEM) Awards, Colorado Springs, CO, September 2009.

**MULLINS, BARRY E.**

Top Student Blue Dart – B. W. Ramsey and B. E. Mullins, “VoIP: I Can Hear You Now, But So Can the Enemy,” Air University Blue Dart, 11 May 2009.

AFIT Instructor of the Quarter, Winter Quarter 2009, 16 July 2009.

Professor Ezra Kotcher Award, awarded by AFIT Board of Visitors, 23 April 2009.

AFIT Civilian of the Quarter-Category III, First Quarter 2009, 23 April 2009.

Dr. Leslie M. Norton Teaching Excellence Award for CY2008, awarded by AFIT Student Association, 26 March 2009.

Outstanding Teaching Award, Eta Kappa Nu, Delta Xi Chapter, Electrical Engineering/Computer Engineering for CY2008, 26 March 2009.

AFIT Thesis Advisor Award, Tau Beta Pi, Ohio Eta Chapter, for K. R. Schrader thesis, 26 March 2009.

Best Paper, C. J. Antosh and B. E. Mullins, “The Scalability of Secure Lock,” *1st IEEE International Workshop on Information and Data Assurance* in conjunction with the *IEEE IPCCC 2008 (27<sup>th</sup> IEEE International Performance Computing and Communications Conference)*, Austin TX, 7-9 December 2008, pp. 507-512.

**OGDEN, JEFFREY A.,**

2008-2009 – Instructor of the Year Award from Ft. Dix, New Jersey, Air Mobility master’s program students.

Highly Commended Award Winner, 2009 Emerald Literati Network Awards for Excellence – Outstanding Paper Competition: Ogden, J.A. and Carter, P.L. (2008) “The Supply Base Reduction Process: An Empirical Investigation,” *The International Journal of Logistics Management*, Vol. 19, No. 1, 5-28.

**RAQUET, JOHN F.,**

Selected to be Fulbright Scholar to Tampere University of Technology, Tampere, Finland.

**SCHMIDT, JASON D.**

Schmidt, J., “Advanced Wavefront Estimation in Strong Turbulence,” AFOSR Young Investigator Award, October 2008.

**THOMAS, RYAN W., Maj**

Air Force Institute of Technology Mid-career Military Engineer of the Year, 2009.

### **2.3.2. STUDENTS**

#### **BELL, LATOSHA D.**

American Nuclear Society Student Achievement Award, June 2009.

#### **BODE, TIM**

2009 Bryce Poe II Award (AF Historical Foundation).

#### **CALLWAY, D. WALKER**

Best Presentation at DCASS in the area of Experimental Fluid Mechanics for the presentation entitled, "Photogrammetric Measurement of Recession Rates of Low Temperature Ablators," March 2009.

#### **COLEMAN, NICHOLAS R.**

"Micro-Scale Flapping Wings," presented at the 34<sup>th</sup> Annual Dayton-Cincinnati Aerospace Science Symposium, Dayton, OH, 3 March 2009. Best Presentation Award Winner.

#### **DIAMOND, THEODORE T.**

2009 Air Force Chief Scientist's Award in Systems Engineering.

#### **FERKO, JOHN**

2009 Bryce Poe II Award (AF Historical Foundation).

#### **GALLAGHER, DANIEL M.**

"Electronic Nose' Could Eliminate Terrorist's IED Advantage," Air University Blue Dart Award for Thesis Research Article, Top 25 Student Paper Award, 2009.

#### **GREEN, NICHOLAS S.**

Melvin E. Gross Award, March 2009.

#### **GUNN, LARRY**

2009 Bryce Poe II Award (AF Historical Foundation).

#### **HEIMAN, THEODORE K.**

2009 Jerome G. Peppers, Jr. Outstanding Student Award, International Society of Logistics (SOLE), March 2009, for his academic record and contributions to the field of logistics. Thesis: "Simulation Modeling of the C-5 Galaxy High Velocity Regionalized Isochronal (HVRISO) Inspection Concept."

#### **HOLZMANN, TIMOTHY W.**

2009 Dean's Award, March 2009, for the most exceptional masters thesis by a graduating student in the Department of Operational Sciences. Thesis: "Probabilistic Estimation of Rare Random Collisions in 3-Space."



**JOHNSON, ROBERT J.**

2008 Geospatial Intelligence Award for Academic Research from the United States Geospatial Intelligence Foundation (USGIF), based on the exceptional work from his masters thesis "Improved Feature Extraction, Feature Selection, and Identification Techniques That Create a Fast Unsupervised Hyperspectral Target Detection Algorithm." Award presented at the 2008 GEOINT Symposium , October 2008.

**KENNEDY, KEVIN T.**

Maj Kevin T. Kennedy, Richard F. Deckro, James T. Moore & Kenneth M. Hopkinson, "Nodal Interdiction," 77th Military Operations Research Society Symposium, June 2009. Selected as Best Presentation in Working Group 1, Strategic Operations, nominated for the Barchi Prize.

**LANIER, CHRISTOPHER**

2009 Jerome G. Peppers, Jr. Outstanding Student Award, International Society of Logistics (SOLE), June 2009, for his academic record and contributions to the field of logistics. Graduate Research Project: "Supply Chain Synchronization: Improving Distribution Velocity to the Theatre."

Melvin E. Gross Award, June 2009, for exceptional achievement, high qualities of character, and leadership.

**LIPINA, ANDREW L.**

2009 Military Operations Research Society (MORS) Award, June 2009, for the graduate research project judged to demonstrate the best application of operations research methodology or theory development to a military problem. Graduate Research Project: "Identifying Critical Factors Affecting Combat Mission Ready Status Among USAF Europe's Aircrew."

**MALDONADO, FERDINAND**

2009 Dean's Award, March 2009, for the most exceptional masters thesis by a graduating student in the Department of Systems and Engineering Management. Thesis: "The Hybrid Counterinsurgency Strategy: System Dynamics Employed to Develop a Behavioral Model of Joint Strategy."

**MATTEI, DANIEL I.**

ATI Association Outstanding Student Award, March 2009.

**McGARY, JOSHUA D.**

2009 Dean's Award, March 2009, for the most exceptional masters thesis by a graduating student in the Department of Engineering Physics. Thesis: "Electrostatic Discharge Properties of Irradiated Nanocomposites."

**MOLINA, CARLOS A.**

2009 Melvin E. Gross Award, March 2009, for exceptional achievement, high qualities of character, and leadership. Thesis: "Reusable Launch Vehicle Design Implications for Regeneration Time."

**NANCE, ROBERT L.**

2009 Military Operations Research Society (MORS) Award, March 2009, for the graduate research project judged to demonstrate the best application of operations research methodology or theory development to a military problem. Thesis: "An Advanced Tabu Search Approach to Solving the Mixed Payload Airlift Load Planning Problem."

**ROCHROHR, RANDALL L.**

American Nuclear Society Student Achievement Award, March 2009.

**ROGERS, MARSHALL**

Air University Blue Dart for thesis titled "An Investigation into the Feasibility of using a Modern Gravity Gradient Instrument for Passive Aircraft Navigation and Terrain Avoidance," March 2009.

**RUTHERFORD, ADAM**

2009 Air Force Chief Scientist's Award in Systems Engineering.

**SCHMITT, DANIEL T.**

2009 Commandant's Award, March 2009, for the most exceptional masters thesis by a graduating student. Thesis: "Automated Knowledge Generation with Persistent Video Surveillance."

**SCHRADER, KARL R.**

Best Presentation in Computer Sciences, *Fourth Annual Dayton Engineering Sciences Symposium*, Wright State University.

Tau Beta Pi Thesis Award, "An FPGA-Based System for Detecting and Tracking Contraband Digital Information Transmitted Via Peer-to-Peer Protocols."

Cyberspace Research Excellence Award, "An FPGA-Based System for Detecting and Tracking Contraband Digital Information Transmitted Via Peer-to-Peer Protocols."

**SHILLAND, GLEN R.**

2009 Edwin E. Aldrin, Sr. Award, March 2009, for exceptional leadership characteristics. Thesis: "Host-Based Multivariate Statistical Computer Operating Process Anomaly Intrusion Detection System (PAIDS)."

**SMITH, AUSTIN**

2009 Dean's Award, March 2009, for the most exceptional masters thesis by a graduating student in the Department of Aeronautics and Astronautics. Thesis: "UAS Collision Avoidance Algorithm that Minimizes the Impact on Route Surveillance."

**TAYLOR, BRETT**

2009 Air Force Chief Scientist's Award in Systems Engineering.

**VAN DEN TOP, TRICIA A.**

2009 Edwin E. Aldrin, Sr. Award, June 2009, for exceptional leadership characteristics. Graduate Research Project: "Small Business Programs: Benefits, Barriers, Bridges, and Critical Factors."

**WELLBAUM, CHRISTOPHER**

2009 Best Student Presentation, 5th Annual Dayton Engineering Sciences Symposium.

### 3. RESEARCH STATISTICS

#### 3.1. RESEARCH ASSESSMENT QUESTIONNAIRE RESULTS

An AFIT Research Assessment Questionnaire, shown on the following page, was sent to each sponsor of a Master's Thesis and Doctoral Dissertation project completed during FY 2009 to determine the project's contribution, significance and cost avoidance. Detailed results of the questions asked are shown in Table 3.1. The data in this table are based on 63 questionnaires returned out of the 271 questionnaires mailed.

Table 3.1: Sponsor Assessment of AFIT Research

QUESTION	
Did this research contribute to a current Air Force/DoD project? (Yes answers)	97%
The thesis work was: Highly significant Significant Slightly significant Not significant	32% 58% 10% 0%
Average man-years of effort saved by the sponsors.	0.995
Average cost avoided per thesis/dissertation by the sponsors.	\$115,238
Total cost avoided for all theses and dissertations sponsored (estimated).	\$32.38M
Rank of respondents* Lt Gen (SES) Lt Col (DR-III/GM-14) Major (DR-II/GM-13)	2% 8% 90%
*Of the 63 questionnaires, 23 respondents did not list Rank/GS levels. These percentages represent only those which responded.	



## RESEARCH ASSESSMENT QUESTIONNAIRE

TO:

Thank you for sponsoring the AFIT thesis or dissertation listed below. AFIT is working hard to keep its research focused on defense technologies of interest to the Air Force and to the nation.

Title:

Student Author:            Designator:

Faculty Advisor:

Date of Graduation:

Please help us determine the value and contribution of this research to your organization's mission by answering the questions below:

1. Did this research contribute to a current task or goal of interest to your organization?    Y / N
2. Would you have completed this work if AFIT had not done it?            Y / N
3. Regardless of your answers above, how would you rate this work?    Highly significant  
Significant  
Slightly significant  
No significance
4. If AFIT had not done this work, please estimate what it would have cost your organization to perform it, either by using in-house resources or by contract. Man-Years \_\_\_\_ \$ \_\_\_\_\_

*Please note that typically an MS thesis requires 0.5MY of the student's time and one month of the faculty advisor's time. For a PhD dissertation the numbers are 2MY for the student and 4 months for the advisor.*

5. Would you like to make any remarks? (These will be shared with the academic department and the faculty chairperson.) (If necessary, please continue on reverse side.)

You may mail this to AFIT/ENR, 2950 Hobson Way, Wright-Patterson AFB OH 45433-7765, or fax it to 937-656-7139 (DSN 986-7139), or just e-mail your answers (only) to 1 to 5 to [research@afit.edu](mailto:research@afit.edu)  
If you use e-mail, please include the designator above so that we might identify the project.

Thank you.

\_\_\_\_\_  
Name of Evaluator            Office Symbol

\_\_\_\_\_  
Grade/Rank of Evaluator

### 3.2. RESEARCH AND CONSULTING OUTPUT 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 FY09, these output measures are shown in Table 3.2.

Table 3.2: Faculty Research and Sponsored Programs Output by Graduate School Department

	Graduate School, by Department						
	Graduate School (EN) Total	Math & Stats (ENC)	Electrical & Comp Eng (ENG)	Engineering Physics (ENP)	Operational Sciences (ENS)	Sys & Eng Management (ENV)	Aeronautics & Astro (ENY)
Number of Faculty (FTE)	140	14	40	21	18	26	21
Refereed Publications	168	20	45	24	21	17	41
Refereed Conferences	397	11	180	36	59	45	66
Sponsor Funded Projects	196	6	68	43	21	16	41
Books	5	0	2	0	1	2	0
Chapters of Books	30	0	11	2	9	7	1
Patents	0	0	0	0	0	0	0
Doctoral Dissertations Advised	20	0	6	2	3	1	8
Master's Theses Advised	261	3	88	27	28	62	53
Graduate Research Papers Advised	38	1	4	0	26	7	0

FTE: Full-time equivalent

### 3.3. 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 88% of technical and 86% of all theses, dissertations, and graduate research papers listed in Table 3.2 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 Table 3.3 and Figure 3.1.

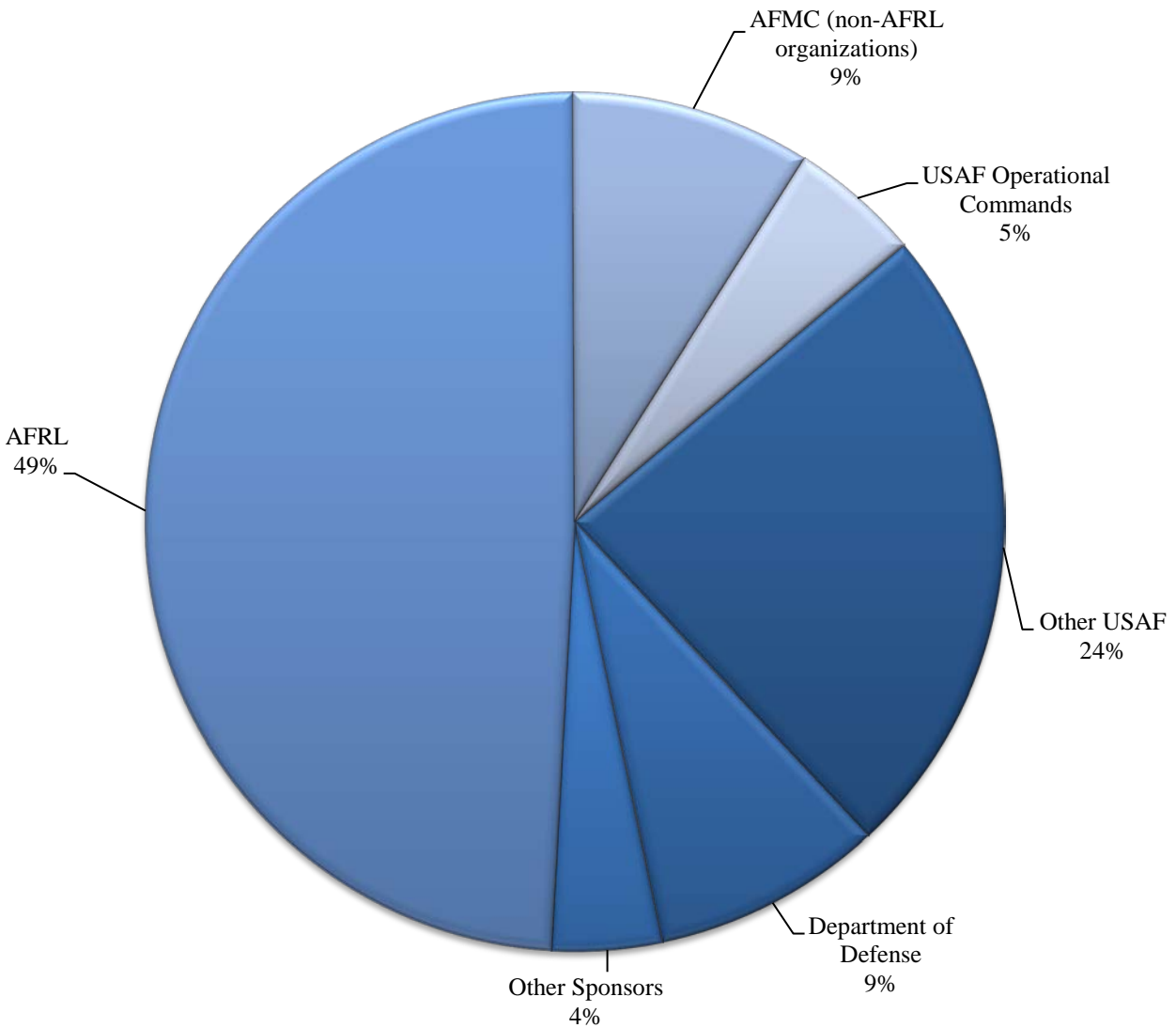


Figure 3.1: Sponsors of AFIT Theses, Dissertations, and Graduate Research Papers

Table 3.3: AFIT External Sponsorship by Organization

SPONSOR ORGANIZATION	PhD Dissertations	Master's Theses	Graduate Research Papers	Funded Projects
HQ UNITED STATES AIR FORCE		16	9	2
OFFICE OF THE SECRETARY OF THE AIR FORCE		5	2	5
AIR EDUCATION AND TRAINING COMMAND		3	1	
AIR COMBAT COMMAND	1	4	1	
National Air and Space Intelligence Center		4	2	10
AIR FORCE MATERIEL COMMAND	1	9	2	5
Aeronautical Systems Center		5		
Air Force Research Laboratory (AFRL)		3		
Air Force Office of Scientific Research (AFOSR)	5	16		25
Air Vehicles Directorate (RB)	4	6	3	23
Directed Energy Directorate (RD)	1	8		6
711 Human Performance Wing		9		11
Information Directorate (RI)		3		3
Materials & Manufacturing Directorate (RX)	2	6		11
Munitions Directorate (RW)		9		1
Propulsion Directorate (RZ)	2	15		4
Sensors Directorate (RY)	4	35	6	23
Space Vehicles Directorate (RV)		3		2
Air Force Test Pilot School		2		
Electronic Systems Center		5		
AIR FORCE SPACE COMMAND		3		
AIR MOBILITY COMMAND		3	10	
US AIR FORCE OPERATING AGENCIES				8
Air Force Communications Agency		2		1
Air Force Information Operations Center		2		
Air Force Technical Application Center				3
Other Operating Agencies		8	1	
DEPARTMENT OF DEFENSE		4	2	21
Defense Threat Reduction Agency		6		5
High Energy Laser Joint Technology Office		2		7
National Security Agency	1	4		6
Office of Secretary Defense		1		2
US Central Command		1		
US Strategic Command				2
US Transportation Command			1	1
United States Army				1
United States Navy		1		
OTHER FEDERAL AGENCIES				1
National Science Foundation				2
NON-FEDERAL AGENCIES		10		4
Dayton Area Graduate Studies Institute	1			1
<b>* TOTALS</b>	22	213	40	196

\*NOTE: Some student publications have multiple sponsors; See App B for Selected Acronym List

### 3.4. OUTSIDE 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 (sponsored or unsponsored) 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. Tables 3.4 and 3.5, and Figure 3.3, summarize outside funding for FY09, and Figure 3.2 summarizes the past ten fiscal years of outside sponsored funding.

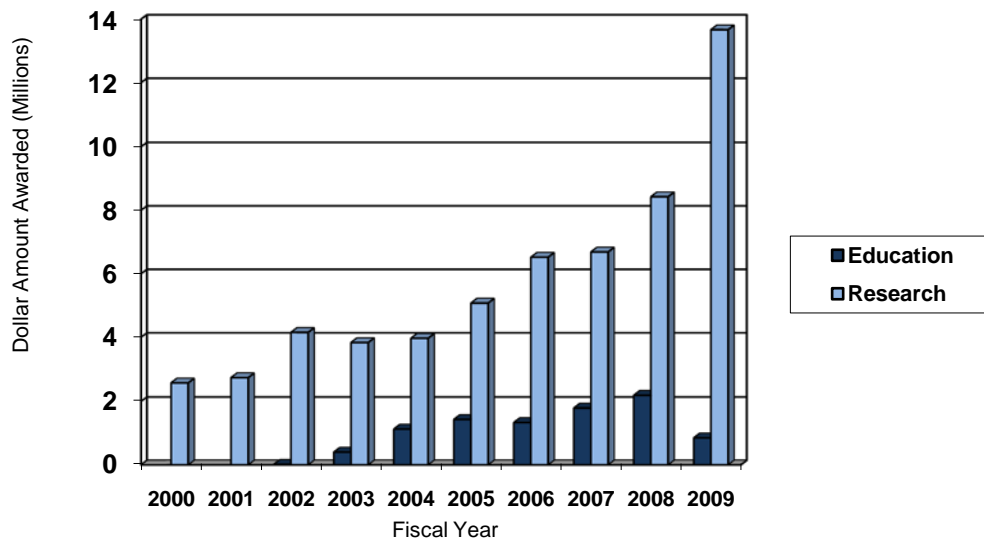
<b>Table 3.4 FY09 External Funding &amp; Research Expenditures to Academic Departments &amp; Research Centers by Type (\$ 1,000's)</b>		<b>Newly Awarded Research Projects</b>		<b>Newly Awarded Education Projects</b>		<b>Total FY09 Newly Awarded Projects</b>		<b>Total FY09 Research Expenditures</b>
<b>Department</b>		<b>#</b>	<b>\$k</b>	<b>#</b>	<b>\$k</b>	<b>#</b>	<b>\$k</b>	<b>\$k</b>
Mathematics & Statistics (ENC)		6	217	-	-	6	217	265
Electrical & Computer Eng (ENG)		67	4,650	1	374	68	5,024	9,327
Engineering Physics (ENP)		35	4,042	8	365	43	4,407	7,062
Research & Sponsored Programs (ENR)		1	17	1	27	2	44	38
Operational Sciences (ENS)		20	2,364	1	20	21	2,384	3,745
Systems and Eng Management (ENV)		15	1,088	1	60	16	1,148	1,659
Aeronautical & Astronautical Eng (ENY)		40	1,290	-	-	40	1,290	5,227
<b>TOTAL</b>		<b>184</b>	<b>13,668</b>	<b>12</b>	<b>846</b>	<b>196</b>	<b>14,514</b>	<b>27,323</b>

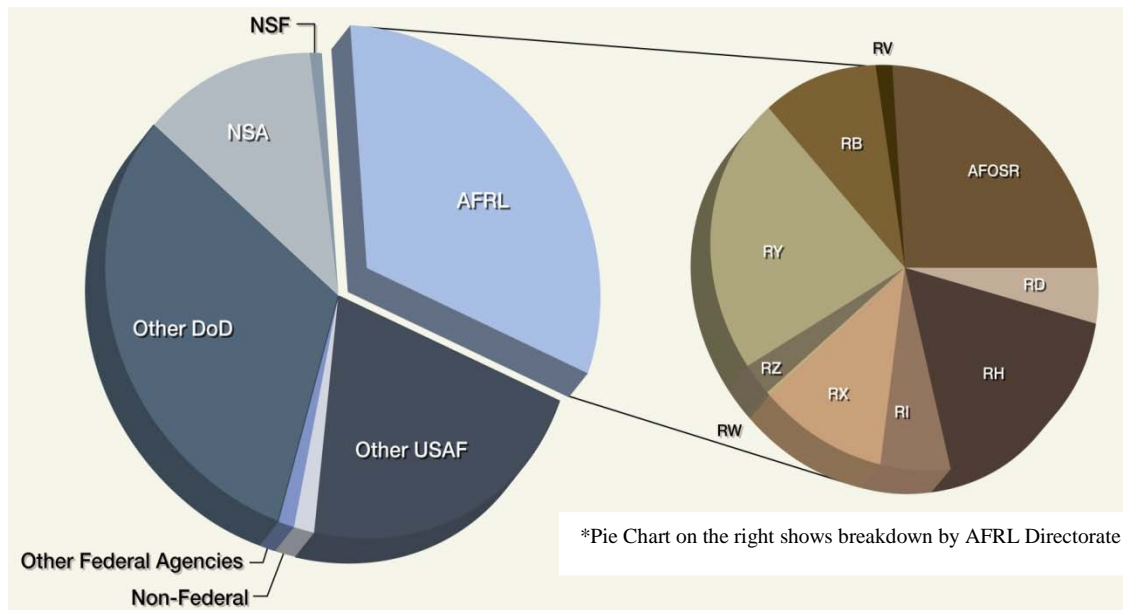
<b>Center</b>		<b>#</b>	<b>\$k</b>	<b>#</b>	<b>\$k</b>	<b>#</b>	<b>\$k</b>	<b>\$k</b>
Advanced Navigation Technology (ANT)		14	790	-	-	14	790	1,524
Center for Directed Energy (CDE)		12	1,500	4	143	16	1,643	1,800
Center for Cyberspace Research (CCR)		15	2,341	1	374	16	2,715	3,364
Center for MASINT Studies and Research (CMSR)		10	1,575	-	-	10	1,575	1,811
Center for Operational Analysis (COA)		22	2,380	1	20	23	2,400	3,668
Center for Systems Engineering (CSE)		7	291	1	60	8	351	560
<b>TOTAL</b>		<b>80</b>	<b>8,877</b>	<b>7</b>	<b>597</b>	<b>87</b>	<b>9,474</b>	<b>12,727</b>

Notes: AFIT reports research expenditures annually via the ASEE and NSF surveys. The numbers may differ slightly due to differences in definitions. Institutional cost matching is included. All Center funds are also included in departmental funding.

Figure 3.2: New Award History FY00-FY09







**Figure 3.3 New FY09 Awards by Sponsor**

**Table 3.5 New FY09 Awards to Academic Departments & Research Centers by Sponsor**

	<i>AFRL</i>	<i>Other USAF</i>	<i>Other DoD</i>	<i>NSA</i>	<i>NSF</i>	<i>Other Federal</i>	<i>Non-Federal</i>	<i>Total</i>
<b>Dept.</b>	<i>\$k</i>	<i>\$k</i>	<i>\$k</i>	<i>\$k</i>	<i>\$k</i>	<i>\$k</i>	<i>\$k</i>	<i>\$k</i>
ENC	197	20	-	-	-	-	-	217
ENG	2,054	402	562	1,796	100	-	110	5,024
ENP	498	1,513	2,240	-	-	156	-	4,407
ENR	17	-	-	-	27	-	-	44
ENS	175	765	1,400	-	-	-	44	2,384
ENV	824	185	129	10	-	-	-	1,148
ENY	926	186	158	-	-	-	20	1,290
<b>TOTAL</b>	<b>4,691</b>	<b>3,070</b>	<b>4,490</b>	<b>1,806</b>	<b>127</b>	<b>156</b>	<b>174</b>	<b>14,514</b>
<b>Research Center</b>	<i>\$k</i>	<i>\$k</i>	<i>\$k</i>	<i>\$k</i>	<i>\$k</i>	<i>\$k</i>	<i>\$k</i>	<i>\$k</i>
ANT	350	210	130	-	-	-	100	790
CCR	792	17	-	1,806	100	-	-	2,715
CDE	359	-	1,284	-	-	-	-	1,643
CMSR	-	1,213	362	-	-	-	-	1,575
COA	207	584	1,565	-	-	-	44	2,400
CSE	50	185	96	-	-	-	20	351
<b>TOTAL</b>	<b>1,758</b>	<b>2,209</b>	<b>3,437</b>	<b>1,806</b>	<b>100</b>	<b>-</b>	<b>164</b>	<b>9,474</b>

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**

GIBSON, WILLIAM T., *Jet Fuel Hedging Strategies for the Department of Defense Through Use of Financial Derivatives*. AFIT/GCA/ENV/09-M04. Faculty Advisor: Maj Todd A. Peachey. Sponsor: SAF.

MASTRO, PETER C. and ORCUTT, RICHARD L., *Application of Reliability and Linear Regression to Enterprise Architecture in Support of the US Air Force's Capability Review and Risk Assessment*. AFIT/GSE/ENV/09-M05. Faculty Advisor: Dr. David R. Jacques. Sponsor: SAF.

ORCUTT, RICHARD L., See MASTRO, PETER C.

SYLVESTER, CHRISTOPHER M., *System Identification of an on Orbit Spacecraft's Antenna Dynamics*. AFIT/GA/ENG/09-01. Faculty Advisor: Dr. Meir Pachter. Sponsor: SAF.

WOODS, CHAD A., *An Economic Analysis of Military Family Housing: Should the Government Continue to Privatize?* AFIT/GFA/ENV/09-M03. Faculty Advisor: Maj Todd A. Peachey. Sponsor: SAF.

#### **GRADUATE RESEARCH PAPERS**

RIVERA, FRANCISCO, *Last Tactical Mile Airlift Requirements/Mix of Assets (QDR)*. AFIT/IMO/ENS/09-14. Faculty Advisor: Dr. James T. Moore. Sponsor: SAF.

#### **AIR FORCE SURGEON GENERAL**

#### **GRADUATE RESEARCH PAPERS**

ESTRIDGE, CHRISTOPHER J., *Material Management of Medical-Surgical Items at Military Healthcare Facilities*. AFIT/ILS/ENS/09-01. Faculty Advisor: Lt Col Pamela S. Donovan. Sponsor: AFMOA/SGAL.

### **4.2. HEADQUARTERS UNITED STATES AIR FORCE**

#### **MASTER'S THESES**

BROWN, DAVID S., *An Evaluation of Solar Air Heating at United States Air Force Installations*. AFIT/GCA/ENV/09-M03. Faculty Advisor: Lt Col Eric J. Unger. Sponsor: HQ USAF.

FETTERS, MICHAEL A., *Achieving Alignment: An Analysis of Enterprise Architecture Best Practices Within the United States Air Force*. AFIT/GIR/ENV/09-M01. Faculty Advisor: Dr. John M. Colombi. Sponsor: HQ USAF/SE.

LANE, CRAIG A., *Data Quality-A Key to Successfully Implementing ECSS*. AFIT/GLM/ENS/09-07. Faculty Advisor: Dr. Jeffrey Ogden. Sponsor: HQ USAF/A4IT.

LEE, SANG M., *Daylighting Strategies for U.S. Air Force Office Facilities: Economic Analysis of Building Energy Performance and Life-Cycle Cost Modeling With Monte Carlo Method*. AFIT/GEM/ENV/09-M08. Faculty Advisor: Lt Col Eric J. Unger. Sponsor: HQ USAF & AFCESA.

LEGRADI, JOSEPH D., *An Exploratory Social Network Analysis of Military and Civilian Emergency Operation Centers Focusing on Organization Structure*. AFIT/GEM/ENV/09-M09. Faculty Advisor: Lt Col David A. Smith. Sponsor: HQ USAF.

MALDONADO, FERDINAND, *The Hybrid Counterinsurgency Strategy: System Dynamics Employed to Develop a Behavioral Model of Joint Strategy*. AFIT/GEM/ENV/09-M10. Faculty Advisor: Dr. Michael L. Shelley. Sponsor: HQ USAF.

SAGLAM, OMER, *Forecasting USAF JP-8 Fuel Needs*. AFIT/GLM/ENS/09-9. Faculty Advisor: Lt Col Bradley E. Anderson. Sponsor: HQ USAF.

SPRAGUE, THOMAS M., *Education and Training as Part of an Expeditionary Combat Support System Implementation Strategy*. AFIT/GLM/ENS/09-10. Faculty Advisor: Dr. Jeffrey Ogden. Sponsor: HQ USAF/A4IT.

VAN KUIKEN, JOSEPH A., *Using Agent-Based Modeling to Evaluate UAS Behaviors in a Target-Rich Environment*. AFIT/GOR/ENS/09-16. Faculty Advisor: Dr. J.O. Miller. Sponsor: HQ USAF.

WALLER, BRIAN D., *Evaluation of Air Force Aircraft Maintenance Metrics for Integration into the Expeditionary Combat Support System*. AFIT/GLM/ENS/09-13. Faculty Advisor: Dr. Jeffrey Ogden. Sponsor: HQ USAF/A4IT.

### **GRADUATE RESEARCH PAPERS**

BEEKER, KEVIN R., *Strategic Deterrence in Cyberspace: Practical Application*. AFIT/ICW/ENG/09-01. Faculty Advisor: Dr. Robert Mills. Sponsor: HQ USAF.

BIRDWELL, MICHAEL B., *If You Don't Know Where You Are Going, You Probably Will End Up Somewhere Else: Computer Network Operations Force Presentation*. AFIT/ICW/ENG/09-02. Faculty Advisor: Dr. Robert Mills. Sponsor: HQ USAF.

CHASE, LEE E., *Integration of Cyber Situational Awareness (SA) into System Design and Development*. AFIT/ISE/ENV/09-J02. Faculty Advisor: Dr. John Colombi. Sponsor: HQ USAF.

LARKOWSKI, MATTHEW P., *The Cyberspace Development Dogfight: Tightening the Acquisitions Turn Circle*. AFIT/ICW/ENG/09-03. Faculty Advisor: Dr. Robert Mills. Sponsor: HQ USAF.

LIPINA, ANDREW J., *Identifying Critical Factors Affecting Combat Mission Ready Status Among USAF Europe's Aircrew*. AFIT/IOA/ENC/09-01. Faculty Advisor: Maj Shay Capehart. Sponsor: HQ USAF.

MARTIN, MARGARET C., *Rated Staff Management*. AFIT/IMO/ENS/09-6. Faculty Advisor: Maj Ben Skipper. Sponsor: HQ USAF.

NAYLOR, RANDY S., *Improving the En Route Mobility System*. AFIT/IMO/ENS/09-9. Faculty Advisor: Dr. William A. Cunningham. Sponsor: HQ USAF/CVAQ.

NEWLIN, JULIE S., *Minimizing the Human Capital Aspect of Productivity Disruption During Implementation of an Enterprise Resource Planning (ERP) System*. AFIT/ILS/ENS/09C-02. Faculty Advisor: Dr. Jeffrey A. Ogden. Sponsor: HQ USAF/A4IT.

PRINCIPI, PHILIP D., *Mitigating Tactical Warfighter Dependence on Link 16*. AFIT/ICW/ENG/09-05. Faculty Advisor: Dr. Robert Mills. Sponsor: ACC & HQ USAF.

## **4.3. AIR FORCE COMMUNICATIONS AGENCY**

### **MASTER'S THESES**

RAMSEY, BENJAMIN W., *Subjective Audio Quality Over a Secure IEEE 802.11n Draft 2.0 Wireless Local Area Network*. AFIT/GE/ENG/09-34. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: AFCA/DN.

SANTOS, LADY NOREEN P., *Voice Traffic Over Mobile Ad Hoc Networks: A Performance Analysis of the Optimized Link State Routing Protocol*. AFIT/GCE/ENG/09-09. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: AFCA/DN.

#### **4.4. AIR COMBAT COMMAND**

##### **DOCTORAL DISSERTATIONS**

TURNBAUGH, MICHAEL A., *A Hybrid Templated-Based Composite Classification System*. AFIT/DS/ENS/08-04. Faculty Advisor: Dr. Kenneth Bauer, Jr. Sponsor: AFOSR & ACC.

##### **MASTER'S THESES**

DOTZLAF, ROSS E., *Modernizing a Preventive Maintenance Strategy for Facility and Infrastructure Maintenance*. AFIT/GEM/ENV/09-M03. Faculty Advisor: Dr. Alfred E. Thal Jr. Sponsor: HQ ACC.

HICKAM, MICHAEL J., *A Cost Analysis of Dining Facilities: Should the Air Force Continue to Operate Dining Facilities?* AFIT/GFA/ENV/09-M01. Faculty Advisor: Lt Col Patrick D. Kee. Sponsor: HQ ACC.

LIM, CHANGWOOK, *Combat Identification Modeling Using Neural Network Techniques*. AFIT/GOR/ENS/09-09. Faculty Advisor: Dr. Kenneth W. Bauer. Sponsor: HQ ACC.

##### **GRADUATE RESEARCH PAPERS**

PRINCIPI, PHILIP D., *Mitigating Tactical Warfighter Dependence on Link 16*. AFIT/ICW/ENG/09-05. Faculty Advisor: Dr. Robert Mills. Sponsor: ACC & HQ USAF.

STEYAERT, TRACE B., *Developing Qualified Logistics Readiness Officers Within Air Combat Command*. AFIT/ILS/ENS/09C-05. Faculty Advisor: Maj Joseph B. Skipper. Sponsor: HQ ACC.

#### **505th COMMAND AND CONTROL WING**

##### **MASTER'S THESES**

WABISZEWSKI, JR., MICHAEL G., *Enhancing Realistic Hands-On Network Training in a Virtual Environment*. AFIT/GCO/ENG/09-05. Faculty Advisor: Maj Todd R. Andel. Sponsor: 505 TRS FTU.

#### **NATIONAL AIR AND SPACE INTELLIGENCE CENTER**

##### **MASTER'S THESES**

DARROW, JOSHUA M., *Thrust Vectoring and Post-Stall Enhancements to the Merlin-Hercules Simulation Program*. AFIT/GSE/ENY/09-M06. Faculty Advisor: Lt Col Frederick G. Harmon. Sponsor: NASIC.

MATTEI, DANIEL I., *The Use of Spider Webs as Passive Bioaerosol Collectors*. AFIT/GWM/ENP/09-M03. Faculty Advisor: Dr. Charles Bleckmann. Sponsor: NASIC.

SULLIVAN, KATHLEEN M., *Numerical Investigation of Geometric Effects on Total Pressure Recovery for Serpentine Ducts*. AFIT/GAE/ENY/09-M14. Faculty Advisor: Dr. Paul King. Sponsor: NASIC.

WEBER, JAMES R., *Modeling of DRFM Waveforms for Classification and Identification of Input Signals*. AFIT/GE/ENG/09-46. Faculty Advisor: Maj Michael A. Saville. Sponsor: NASIC.

## **GRADUATE RESEARCH PAPERS**

PARDEE, BRIAN D. and WALLS, DANIEL P., *Third Party Targeting: A Quantitative Analysis Using BRAWLER*. AFIT/IOA/ENS/09-09C-04. Faculty Advisor: Dr. J.O. Miller. Sponsor: NASIC.

WALLS, DANIEL P., See PARDEE, BRIAN D.

## **4.5. AIR EDUCATION AND TRAINING COMMAND**

### **MASTER'S THESES**

LEDFORD, CHRISTOPHER B., *Dynamic Modeling of the Economic Impacts of a Terrorist Attack Using a Radiological Dispersion Device*. AFIT/GEM/ENV/09-M07. Faculty Advisor: Lt Col David A. Smith. Sponsor: AETC.

HOLZMANN, TIMOTHY, *Probabilistic Estimation of Rare Random Collisions in 3-Space*. AFIT/GOR/ENS/09-07. Faculty Advisor: Dr. Jeffery Cochran. Sponsor: Air University.

## **GRADUATE RESEARCH PAPERS**

HAUCK, DAVID R., *Reengineering JSUPT*. AFIT/IMO/ENS/09-2. Faculty Advisor: Dr. William A. Cunningham. Sponsor: HQ AETC.

## **82nd TRAINING WING**

### **MASTER'S THESES**

YELVERTON, STEVEN D., *Evaluating the Influence of Past Gaming Experience on Learner Preferences and Motivation to Learn in a Military Training Environment*. AFIT/GRD/ENV/09-M06. Faculty Advisor: Dr. Alfred E. Thal Jr. Sponsor: 82 TRW.

## **AIR FORCE INSTITUTE OF TECHNOLOGY**

### **DOCTORAL DISSERTATIONS**

KENNEDY, KEVIN T., *Synthesis, Interdiction, and Protection of Layered Networks*. AFIT/DS/ENS/09-01. Faculty Advisor: Dr. Richard F. Deckro. Sponsor: N/A.

KUHN, JEFFREY D., *Changes in Structural Health Monitoring System Capability Due to Aircraft Environmental Factors*. AFIT/DS/ENV/09S-01. Faculty Advisor: Dr. Som R. Soni. Sponsor: N/A.

LEINART, JAMES A., *Characterizing and Detecting Unrevealed Elements of Network Systems*. AFIT/DS/ENS/08-01W. Faculty Advisor: Dr. Richard F. Deckro. Sponsor: N/A.

MCCLUNG, AMBER J., *Extension of Viscoplasticity Based on Overstress to Capture the Effects of Prior Aging on the Time Dependent Deformation Behavior of a High-Temperature Polymer: Experiments and Modeling*. AFIT/DS/ENY/08/D15. Faculty Advisor: Dr. Marina B. Ruggles-Wrenn. Sponsor: N/A.

### **MASTER'S THESES**

ALEMAN, SALVADOR, *Satellite Reentry Control Via Surface Area Amplification*. AFIT/GSS/ENY/09-M01. Faculty Advisor: Dr. William E. Wiesel. Sponsor: N/A.

ARENDT, CHRISTOPHER D., *Adaptive Pareto Set Estimation for Stochastic Mixed Variable Design Problems*. AFIT/GOR/ENS/09-01. Faculty Advisor: Dr. James W. Chrissis. Sponsor: N/A.

BARKER, MARGARET A., GURBUZ, FATIH S., and SCHROEDER, JEREMY A., *Assessing Structural Health Monitoring Alternatives Utilizing a Value-Focused Thinking Model*. AFIT/GSE/ENV/09-M04. Faculty Advisor: Dr. Som Soni. Sponsor: N/A.

BOOTH, CHRISTOPHER E., *Surveillance Using Multiple Unmanned Aerial Vehicles*. AFIT/GSS/ENY/09-M02. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: N/A.

BROWN, REBECCA S., *An Analysis of Construction Contractor Performance Evaluation System*. AFIT/GEM/ENV/09-M01. Faculty Advisor: Lt Col Christopher J. West. Sponsor: N/A.

BUYUKGURAL, FERIT, *A 4-Step Process Evaluation Model to Assess the Success of Performance Based Logistics Contracts*. AFIT/GLM/ENS/09-2. Faculty Advisor: Dr. Martha Cooper. Sponsor: N/A.

CARLTON, CHRISTOPHER L., *Lucky Imaging of Low Earth Orbit Satellites*. AFIT/GA/ENY/09-M01. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: N/A.

CEBECI, FATIH, *Implementation of Performance-Based Acquisition in Non-Western Countries*. AFIT/GLM/ENV/09-M01. Faculty Advisor: Lt Col R. David Fass. Sponsor: N/A.

CHAPARRO, ORLANDO M., *Heterogeneity Effects in Plutonium Contaminated Soil*. AFIT/GES/ENV/09-M01. Faculty Advisor: Lt Col David A. Smith. Sponsor: N/A.

COLDSNOW, MATTHEW W., *Alternative Methods to Standby Gain Scheduling Following Air Data System Failure*. AFIT/GAE/ENY/09-S02. Faculty Advisor: Lt Col Paul A. Blue. Sponsor: N/A.

CONSTANTINE, ALEXANDER N., *Information Technology and the Evolution of the Library*. AFIT/GRD/ENV/09M-01. Faculty Advisor: Dr. Alan R. Heminger. Sponsor: N/A.

COOPER, BRETT J., *Rigidizable Inflatable Get-Away-Special Experiment (RIGEX) Post Flight Analysis, Ground Testing, Modeling, and Future Applications*. AFIT/GA/ENY/09-M02. Faculty Advisor: Dr. Jonathan Black. Sponsor: N/A.

CRAFT, CHRISTOPHER T., *Formation Flight of Earth Satellites on KAM Tori*. AFIT/GA/ENY/09-S01. Faculty Advisor: Dr. William E. Wiesel. Sponsor: N/A.

DAVIS, MATTHEW T., *Using Multiple Robust Parameter Design Techniques to Improve Hyperspectral Anomaly Detection Algorithm Performance*. AFIT/GOR/ENS/09-05. Faculty Advisor: Dr. Kenneth W. Bauer. Sponsor: N/A.

DEXTER, MICHAEL L., *Production and Characterization of High Repetition Rate Terahertz Radiation in Femtosecond-Laser-Induced Air Plasma*. AFIT/GAP/ENP/09-M04. Faculty Advisor: Lt Col Matthew J. Bohn. Sponsor: N/A.

ELBAUM, JOSEPH M., *Cyber Power in the 21st Century*. AFIT/GCO/ENG/09-01. Faculty Advisor: Dr. Robert F. Mills. Sponsor: N/A.

FREDIN, PAUL W., *Ground Source Heat Pumps vs. Conventional HVAC: A Comparison of Economic and Environmental Costs*. AFIT/GEM/ENV/09-M05. Faculty Advisor: Dr. Alfred E. Thal Jr. Sponsor: N/A.

GOCMEN, MURAT, *The Benefits of a Network Tasking Order in Combat Search and Rescue Missions*. AFIT/GCE/ENG/09-01. Faculty Advisor: Dr. Kenneth Hopkinson. Sponsor: N/A.

GREGORY, AARON L., *Modeling the Economic Impacts of Large Deployments on Local Communities*. AFIT/GCA/ENV/08-D01. Faculty Advisor: Lt Col Jeffery Smith. Sponsor: N/A.

GULER, CAGLAR UTKU, *Ohio River Denial as a Transportation Corridor and Its Economic Impacts on the Energy Industry*. AFIT/GLM/ENS/09-5. Faculty Advisor: Dr. Alan W. Johnson. Sponsor: N/A.

GURBUZ, FATIH S., See BARKER, MARGARET A.

JOHNSON, MICHAEL D., *Dynamic Supersonic Base Store Ejection Simulation Using Beggar*. AFIT/GAE/ENY/08-D01. Faculty Advisor: Dr. Mark F. Reeder. Sponsor: N/A.

JOHNSTON, JEFFREY S., *A Feasibility Study of a Persistent Monitoring System for the Flight Deck of U.S. Navy Aircraft Carriers*. AFIT/GAE/ENY/09-M12. Faculty Advisor: Lt Col Eric D. Swenson. Sponsor: N/A.

KIM, MINGOOK, *Stochastic Estimation and Control of Queues Within a Computer Network*. AFIT/GCS/ENG/09-04. Faculty Advisor: Lt Col Stuart Kurkowski. Sponsor: N/A.

KOSSLER, MAURICIO, *Patterning and Characterization of Carbon Nanotubes Grown in a Microwave Plasma Enhanced Chemical Vapor Deposition Chamber*. AFIT/GE/ENG/09-25. Faculty Advisor: Lt Col Ronald A. Coutu. Sponsor: N/A.

LAMOTT, ROBERT B., *Analysis and Application of the Bi-directional Scatter Distribution Function of Photonic Crystals*. AFIT/GEO/ENP/09-M01. Faculty Advisor: Dr. Michael A. Marciniak. Sponsor: N/A.

LEACH, ERIKA C., *Mitigating Insider Sabotage and Espionage: A Review of the United States Air Force's Current Posture*. AFIT/GIR/ENG/09-05. Faculty Advisor: Dr. Robert F. Mills. Sponsor: N/A.

LITTLE, BRYAN, *Application of KAM Theorem to Earth Orbiting Satellites*. AFIT/GA/ENY/09-M05. Faculty Advisor: Dr. William Wiesel. Sponsor: N/A.

MAJOR, MICHAEL P., *Analysis of Dynamic Flight Simulation and the Fidelity of the ATFS-400TM Phoenix Tactical Flight Simulator*. AFIT/GAE/ENY/09-S04. Faculty Advisor: Lt Col Christopher M. Shearer. Sponsor: N/A.

McGARY, JOSHUA D., *Electrostatic Discharge Properties of Irradiated Nanocomposites*. AFIT/GNE/ENP/09-M03. Faculty Advisor: Dr. James C. Petrosky. Sponsor: N/A.

MILLAR, JEREMY, *JIEDDO Incident Report Text Analysis*. AFIT/GCS/ENG/09-05. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: N/A.

MILLER, MICHAEL K., *Exploitation of Intra-Spectral Band Correlation for Rapid Feature Selection and Target Identification in Hyperspectral Imagery*. AFIT/GOR/ENS/09-10. Faculty Advisor: Dr. Kenneth W. Bauer. Sponsor: N/A.

MOLINA, CARLOS ALBERTO, *Reusable Launch Vehicle Design Implications for Regeneration Time*. AFIT/GLM/ENS/09-08. Faculty Advisor: Dr. Alan W. Johnson. Sponsor: N/A.

NYE, ANDREW, *Ceramic Matrix Composite Characterization Under a Combustion and Loading Environment*. AFIT/GMS/ENY/09-M01. Faculty Advisor: Dr. Shankar Mall. Sponsor: N/A.

PAGEL, BRETT A., *Automated Virtual Machine Introspection for Host-Based Intrusion Detection*. AFIT/GCE/ENG/09-07. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: N/A.

POGORZELSKI, WILLIAM A., *Software Acquisition Improvement in the Aeronautical Systems Center*. AFIT/GRD/ENV/08-S1. Faculty Advisor: Lt Col Brian Hermann. Sponsor: N/A.

RODRIGUEZ, JAVIER, *Fatigue Evaluation of Nanocomposites as Lightweight Electronic Enclosures for Satellites' Applications*. AFIT/GMS/ENY/09-M03. Faculty Advisor: Dr. Shankar Mall. Sponsor: N/A.

SCHROEDER, JEREMY A., See BARKER, MARGARET A.

SHEIRICH, PHILIP, *An Engineering Trade Space Analysis for a Space-Based Hyperspectral Chromotomographic Scanner*. AFIT/GA/ENY/09-M08. Faculty Advisor: Dr. Jonathan Black. Sponsor: N/A.

SLAGLE, STEVEN E., *Advanced Radiometry for High Discrimination Explosive Fireball Discrimination*. AFIT/GEO/ENP/09-M02. Faculty Advisor: Dr. Kevin C. Gross. Sponsor: N/A.

SMITH, DANIEL K., *An Analysis of Defense Information and Information Technology Articles: A Sixteen Year Perspective*. AFIT/GIR/ENV/09-M03. Faculty Advisor: Dr. Dennis Strouble. Sponsor: N/A.

SPAULDING, JONATHAN C., *Predicting Solar Protons: A Statistical Approach*. AFIT/GAP/ENP/09-M09. Faculty Advisor: Maj Ariel Acebal. Sponsor: N/A.

SWIFT, SETH M., *Q-Switched and Mode Locked Short Pulses from a Diode Pumped, Yb-Doped Fiber Laser*. AFIT/GAP/ENP/09-M10. Faculty Advisor: Lt Col Matthew J. Bohn. Sponsor: N/A.

TRAYLOR II, ALFRED G., *Effects of Contact Load on the Fretting Fatigue Behavior of IN-100 at Elevated Temperature*. AFIT/GMS/ENY/09-M04. Faculty Advisor: Dr. Shankar Mall. Sponsor: N/A.

WORDEN, THOMAS E., *A Comparison of the U.S. Air Force Fitness Test and Sister Services' Combat-Oriented Fitness Tests*. AFIT/GEM/ENC/09-01. Faculty Advisor: Dr. Edward D. White. Sponsor: N/A.

## **4.6. AIR FORCE MATERIEL COMMAND**

### **DOCTORAL DISSERTATIONS**

LOUTHAIN, JAMES A., *Integrated Approach to Airborne Laser Communication*. AFIT/DEE/ENG/09-02. Faculty Advisor: Maj Jason D. Schmidt. Sponsor: AFMC & AFRL/RD.

### **MASTER'S THESES**

BACON, JEFFREY B., *Thermal Inactivation of Bacillus anthracis Using Laser Irradiation of Micro-Etched Platforms*. AFIT/GWM/ENP/09-M01. Faculty Advisor: Dr. Larry Burggraf. Sponsor: AFMC/CX.

GUZMAN, JUAN J., *An Econometric Analysis of the Effectiveness of Compensation to Retention*. AFIT/GCA/ENV/09-M06. Faculty Advisor: Lt Col Eric J. Unger. Sponsor: HQ AFMC.

HESS, TYLER J., *Cost Forecasting Models for the Air Force Flying Hour Program*. AFIT/GCA/ENV/09-M07. Faculty Advisor: Lt Col Eric J. Unger. Sponsor: AFMC.

KNIGHT, EMILY A., *Modeling Thermal Inactivation of Bacillus Spores*. AFIT/GAM/ENC/09-01. Faculty Advisor: Dr. William P. Baker. Sponsor: AFMC/CX.

REDERUS, LUKE A., *A MEMS Multi-Cantilever Variable Capacitor on Metamaterial*. AFIT/GE/ENG/09-35. Faculty Advisor: Maj LaVern A. Starman. Sponsor: AFMC.

### **GRADUATE RESEARCH PAPERS**

LILJENSTOLPE, MATTHEW, *Single-Pass Serial Scheduling Heuristic for Eglin AFB Range Services Division Schedule*. AFIT/IOA/ENS/09C-02. Faculty Advisor: Dr. James T. Moore. Sponsor: HQ AFMC.

MORGAN, ERIC E., *Operation Team Spirit: Program Review and Analysis*. AFIT/ILS/ENS/09-03. Faculty Advisor: Lt Col Stephen P. Chambal. Sponsor: HQ AFMC.



#### **46th TEST WING**

##### **MASTER'S THESES**

COHEN, ALLEN N., *Examining Split-Plot Designs for Developmental and Operational Testing*. AFIT/GOR/ENS/09-04. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: AFMC/46 TW.

McSHANE, JOHN D., *Application of Time-Frequency Representation to Non-Stationary Radar Cross Section*. AFIT/GE/ENG/09-28. Faculty Advisor: Dr. Peter Collins. Sponsor: 46th Test Wing.

#### **75th AIR BASE WING**

##### **MASTER'S THESES**

BAUER, JOSEPH M., *Modeling U.S. Occupational Health Costs*. AFIT/GCA/ENV/09-M02. Faculty Advisor: Maj Jeremy M. Slagley. Sponsor: 75 ABW/AMDS.

#### **412th TEST WING**

##### **MASTER'S THESES**

BLAKE, RYAN, *Boundary Avoidance Tracking: Consequences (and Uses) of Imposed Boundaries on Pilot-Aircraft Performance*. AFIT/GAE/ENV/09-M03. Faculty Advisor: Lt Col Paul Blue. Sponsor: AFMC/412th TW.

#### **AERONAUTICAL SYSTEMS CENTER**

##### **MASTER'S THESES**

GABER, HARVEY S., *Waste Vegetable Oil as an Alternative Fuel for Diesel Vehicles*. AFIT/GEM/ENS/09-01. Faculty Advisor: Lt Col Bradley E. Anderson. Sponsor: ASC.

GRAY, STEPHEN E., *The Correlation of Human Capital on Costs of Air Force Acquisition Programs*. AFIT/GCA/ENV/09-M05. Faculty Advisor: Lt Col Patrick D. Kee. Sponsor: AESW.

McLAUGHLIN, WILLIAM J., *Modeling of Aircraft Deicing Fluid Induced Biochemical Oxygen Demand in Subsurface-Flow Constructed Treatment Wetlands*. AFIT/GEM/ENV/09-M12. Faculty Advisor: Dr. Charles Bleckmann. Sponsor: 312 AESG/SYE.

VITAS, JASON A., *The Impact of Acquisition Policy Variation on Program Strategy and Execution: A Case Study of the Joint Primary Aircraft Training System (JPATS) Program*. AFIT/GIR/ENV/09-M05. Faculty Advisor: Dr. Alan Heminger. Sponsor: ASC/664 AESS.

VOOTH, GREGORY W., *Classification of Schedule Management Barriers Through Concept Mapping*. AFIT/GRD/ENV/09-M05. Faculty Advisor: Lt Col Patrick D. Kee. Sponsor: ASC/AQF.

#### **AIR FORCE RESEARCH LABORATORY [AFRL]**

##### **MASTER'S THESES**

BEHM, STEPHEN M., PITZER, BRADFORD J., and WHITE, JANE F., *A Tailored Systems Engineering Framework for Science and Technology Projects*. AFIT/GSE/ENV/09-M02. Faculty Advisor: Dr. David R. Jacques. Sponsor: AFRL/XP.

PITZER, BRADFORD J., See BEHM, STEPHEN M.

WHITE, JANE F., See BEHM, STEPHEN M.

## **AFRL: AIR FORCE OFFICE OF SCIENTIFIC RESEARCH**

### **DOCTORAL DISSERTATIONS**

- GARVIN, MATTHEW B., *The Effective Potential Energy Surfaces of the Nonadiabatic Collision*. AFIT/DS/ENP/09-J01. Faculty Advisor: Dr. David E. Weeks. Sponsor: AFOSR.
- McCLUNG, AARON M., *Influence of Structural Flexibility on Flapping Wing Propulsion*. AFIT/DS/ENY/09-J01. Faculty Advisor: Lt Col Raymond C. Maple. Sponsor: AFOSR & AFRL/RB.
- OIMOEN, STEVEN C., *Dynamic Network Formation Using Ant Colony Optimization*. AFIT/DCS/ENG/09-06. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: AFOSR.
- TURNBAUGH, MICHAEL A., *A Hybrid Templated-Based Composite Classification System*. AFIT/DS/ENS/08-04. Faculty Advisor: Dr. Kenneth Bauer, Jr. Sponsor: AFOSR & ACC.
- WICKERT, DOUGLAS P., *Least-Squares, Continuous Sensitivity Analysis For Nonlinear Fluid-Structure Interaction*. AFIT/DS/ENY/09-S04. Faculty Advisor: Dr. Robert A. Canfield. Sponsor: AFOSR & AFRL/RB.

### **MASTER'S THESES**

- CIAMPA, MICHAEL A., *Failure Detection of a Pseudolite-Based Reference System Using Residual Monitoring*. AFIT/GE/ENG/09-08. Faculty Advisor: Dr. John Raquet. Sponsor: AFOSR.
- GOMEZ, TRAVIS C., *Investigation of Electrical and Optical Properties of Bulk III-V Ternary Semiconductors*. AFIT/GMS/ENP/09-M01. Faculty Advisor: Dr. Yung Kee Yeo. Sponsor: AFOSR.
- GRUTERS, TYLER F., *Effects of Prior Aging at 288°C in Argon Environment on Creep Response of Carbon Fiber Reinforced PMR-15 Composite With  $\pm 45^\circ$  Fiber Orientation at 288°C*. AFIT/GAE/ENY/09-J02. Faculty Advisor: Dr. Marina Ruggles-Wrenn. Sponsor: AFOSR.
- KIM, HAN SEOK, *Removing Redundant Logic Pathways in Polymorphic Circuits*. AFIT/GCS/ENG/09-03. Faculty Advisor: Lt Col J. Todd McDonald. Sponsor: AFOSR.
- KOMIVES, JEFFREY R., *Development of Non-Uniform Radiation Solution Methods for Atmospheric Re-entry Using Detailed Thermal Modeling*. AFIT/GAE/ENY/09-M13. Faculty Advisor: Dr. Robert B. Greendyke. Sponsor: AFOSR.
- LACY, BRENT R., *A Wigner Distribution Analysis of One Dimensional Scattering*. AFIT/GAP/ENP/09-M06. Faculty Advisor: Dr. David E. Weeks. Sponsor: AFOSR.
- LARWECK, ANTHONY L., *Using a Multiobjective Approach to Balance Mission and Network Goals Within a Delay Tolerant Network Topology*. AFIT/GE/ENG/09-26. Faculty Advisor: Capt Ryan W. Thomas. Sponsor: AFOSR.
- OLSON, MATTHEW T., *The Development of IT Suspicion as a Construct and Subsequent Measure*. AFIT/GEM/ENV/09-M15. Faculty Advisor: Lt Col Alexander J. Barelka. Sponsor: AFOSR/NL.
- OQUENDO CLASS, LUIS A., *Optimized Robust Adaptive Networks in Supervisory Control and Data Acquisition Systems*. AFIT/GE/ENG/09-31. Faculty Advisor: Dr. Kenneth M. Hopkinson. Sponsor: AFOSR.
- OZMEN, OZGUR, *Effects of Prior Aging at 316°C in Argon on Inelastic Deformation Behavior of PMR-15 Polymer at 316°C: Experiment and Modeling*. AFIT/GSS/ENY/09-M06. Faculty Advisor: Dr. Marina B. Ruggles-Wrenn. Sponsor: AFOSR.

SERIANNE, CHRISTINA R., *Tunable Diode Laser Absorption Spectroscopy Verification Analysis for Use in the Combustion Optimization and Analysis Laser Laboratory*. AFIT/GAE/ENY/09-M17. Faculty Advisor: Lt Col Richard Branam. Sponsor: AFOSR.

SEVY, BRADLEY D., *Using Covert Means to Establish Cybercraft Command and Control*. AFIT/GCS/ENG/09-07. Faculty Advisor: Lt Col J. Todd McDonald. Sponsor: AFOSR.

SIMONAIRE, ERIC D., *Sub-circuit Selection and Replacement Algorithms Modeled as Term Rewriting Systems*. AFIT/GCO/ENG/09-02. Faculty Advisor: Lt Col J. Todd McDonald. Sponsor: AFOSR.

WEIR, JOHN S., *Enhancing the NS-2 Network Simulator for Near Real-Time Control Feedback and Distributed Simulation Breaks*. AFIT/GE/ENG/09-47. Faculty Advisor: Lt Col Stuart Kurkowski. Sponsor: AFOSR.

WILLIAMS, JASON A., *Characterizing Component Hiding Using Ancestral Entropy*. AFIT/GCE/ENG/09-12. Faculty Advisor: Lt Col J. Todd McDonald. Sponsor: AFOSR.

YETISTI, CIGDEM, *Dynamic Interactions for Network Visualization and Simulation*. AFIT/GE/ENG/09-50. Faculty Advisor: Lt Col Stuart Kurkowski. Sponsor: AFOSR.

#### **AFRL: AIR VEHICLES DIRECTORATE**

##### **DOCTORAL DISSERTATIONS**

BOND, VANESSA L., *Flexible Twist for Pitch Control in a High Altitude Long Endurance Aircraft with Nonlinear Response*. AFIT/DS/ENY/08-D11. Faculty Advisor: Dr. Robert A. Canfield. Sponsor: AFRL/RB.

McCLUNG, AARON M., *Influence of Structural Flexibility on Flapping Wing Propulsion*. AFIT/DS/ENY/09-J01. Faculty Advisor: Lt Col Raymond C. Maple. Sponsor: AFOSR & AFRL/RB.

RASMUSSEN, CODY C., *Least-Squares Finite Element Formulation for Fluid-Structure Interaction*. AFIT/DS/ENY/09-M16. Faculty Advisor: Dr. Robert A. Canfield. Sponsor: AFRL/RB.

WICKERT, DOUGLAS P., *Least-Squares, Continuous Sensitivity Analysis For Nonlinear Fluid-Structure Interaction*. AFIT/DS/ENY/09-S04. Faculty Advisor: Dr. Robert A. Canfield. Sponsor: AFOSR & AFRL/RB.

##### **MASTER'S THESES**

BENTLEY, BROOK I., *An Investigation of Shock Wave Physics Via Hybrid CFD-BGK Solution Methods for Nonequilibrium Flows*. AFIT/GAE/ENY/09-M02. Faculty Advisor: Dr. Robert Greendyke. Sponsor: AFRL/RB.

COX, GEOFFREY S., *Thermomechanical Properties of Center-Reinforced Aluminum*. AFIT/GAE/ENY/09-M04. Faculty Advisor: Dr. Marina B. Ruggles-Wrenn. Sponsor: AFRL/RB.

CURTIS, DAVID H., *Laser Dot Projection Photogrammetry and Force Balance Measurement Techniques for Flapping Wing Micro Air Vehicles*. AFIT/GAE/ENY/09-M05. Faculty Advisor: Dr. Mark F. Reeder. Sponsor: AFRL/RB.

GREEN, NICHOLAS S., *Structural Optimization of Joined-Wing Beam Model With Bend-Twist Coupling Using Equivalent Static Loads*. AFIT/GAE/ENY/09-J01. Faculty Advisor: Lt Col Eric Swenson. Sponsor: AFRL/RB.

SIMMONS, JOSEPH R., *Aeroelastic Optimization of Sounding Rocket Fins*. AFIT/GSS/ENY/09-J02. Faculty Advisor: Dr. Jonathon Black. Sponsor: AFRL/RB.

TURAN, MUSTAFA, *Tools for the Conceptual Design and Engineering Analysis of Micro Air Vehicles*. AFIT/GAE/ENY/09-M19. Faculty Advisor: Lt Col Frederick G. Harmon. Sponsor: AFRL/RB.

#### **GRADUATE RESEARCH PAPERS**

DIAMOND, THEODORE T., RUTHERFORD, ADAM L., and TAYLOR, JONATHAN B., *Cooperative Unmanned Aerial Surveillance Control System Architecture*. AFIT/GSE/ENV/09-M07. Faculty Advisor: Dr. David R. Jacques. Sponsor: AFRL/RB.

RUTHERFORD, ADAM L., See DIAMOND, THEODORE T.

TAYLOR, JONATHAN B., See DIAMOND, THEODORE T.

#### **AFRL: DIRECTED ENERGY DIRECTORATE**

#### **DOCTORAL DISSERTATIONS**

LOUTHAIN, JAMES A., *Integrated Approach to Airborne Laser Communication*. AFIT/DEE/ENG/09-02. Faculty Advisor: Maj Jason D. Schmidt. Sponsor: AFMC & AFRL/RD.

#### **MASTER'S THESES**

DULSKI, MICHAEL R., *Use of Multi-Conjugate Adaptive Optics on Aero-Optical and Free-Stream Turbulence*. AFIT/GE/ENG/09-13. Faculty Advisor: Maj Jason D. Schmidt. Sponsor: AFRL/RD.

ENGSTROM, NATHAN D., *Misregistration in Adaptive Optics Systems*. AFIT/GE/ENG/09-14. Faculty Advisor: Maj Jason D. Schmidt. Sponsor: AFRL/RD.

GROVES, SEAN G., *Predictive Control Using a priori Effective Wind Velocities in an Adaptive Optics System*. AFIT/EO/ENG/09-01. Faculty Advisor: Lt Col Gregory J. Toussaint. Sponsor: AFRL/RD.

JAMES, STEVEN P., *Blind Deconvolution Through Polarization Diversity of Long Exposure Imagery*. AFIT/EO/ENG/09-06. Faculty Advisor: Dr. Stephen C. Cain. Sponsor: AFRL/RD.

MONZ, ADRIAN, *Evaluation of Performance of a Maximum Likelihood Estimator for Tracking Purposes in the Presence of Speckle Noise*. AFIT/GE/ENG/09-29. Faculty Advisor: Maj Jason D. Schmidt. Sponsor: AFRL/RD.

O'DELL, ANTHONY P., *Detecting Near-Earth Objects Using Cross-Correlation with a Point Spread Function*. AFIT/GE/ENG/09-30. Faculty Advisor: Dr. Stephen C. Cain. Sponsor: AFRL/RD.

PEREZ, JIMMIE J., *Adaptive Control of Woofer-Tweeter Adaptive Optics*. AFIT/GE/ENG/09-33. Faculty Advisor: Lt Col Gregory J. Toussaint. Sponsor: AFRL/RD.

ROGERS, NEIL G., *Electron Multipactor: Theory Review, Comparison and Modeling of Mitigation Techniques in ICEPIC*. AFIT/GE/ENP/09-M02. Faculty Advisor: Dr. William F. Bailey. Sponsor: AFRL/RD.

#### **AFRL: 711th HUMAN PERFORMANCE WING/RH**

#### **MASTER'S THESES**

BETZ, JEREMIAH N., *Production of Recombinant Injectosome and Outer Membrane Proteins from Yersinia Pestis KIM5*. AFIT/GWM/ENP/09-S01. Faculty Advisor: Lt Col David A Smith. Sponsor: 711 HPW/RH.

CONNER, J. PAUL, *The Social Influence Qualities of Social Network Sites: A Qualitative and Experimental Investigation*. AFIT/GEM/ENV/09-M02. Faculty Advisor: Lt Col Alexander J. Barelka. Sponsor: 711 HPW/RH.

CRING, ERIC A. and LENFESTEY, ADAM G., *Architecting Human Operator Trust in Automation to Improve System Effectiveness in Multiple Unmanned Aerial Vehicles (UAV)*. AFIT/GSE/ENV/09-M06. Faculty Advisor: Dr. John Colombi. Sponsor: 711 HPW/RH.

KEARNS, CHRISTINA R., *In Vitro Toxicity of Silver Nanoparticles in Human Lung Epithelial Cells*. AFIT/GWM/ENP/09-M02. Faculty Advisor: Lt Col David A. Smith. Sponsor: 711 HPW/RH.

LeBRUN, MICHAEL T., *The Economic Impact of a Radiological Dispersal Device (RDE)*. AFIT/GFA/ENV/09-M02. Faculty Advisor: Lt Col David A. Smith. Sponsor: 711 HPW/RH.

LENFESTEY, ADAM G., See CRING, ERIC A.

MILLS, STEPHANIE J., *Social Networking Website Users and Privacy Concerns: A Mixed Methods Investigation*. AFIT/GEM/ENV/09-M14. Faculty Advisor: Lt Col Alexander J. Barelka. Sponsor: 711 HPW/RH.

SHIELDS, JAMES H., *Power Generation by Harvesting Ambient Energy with a Micro-Electromagnetic Generator*. AFIT/GE/ENG/09-42. Faculty Advisor: Maj LaVern A. Starman. Sponsor: 711 HPW/RH.

WALINSKI, RYAN G., *The Emergence of a Content Acceptance Model (CAM): New Thoughts Regarding the Trial, Adoption, and Usage of New Media*. AFIT/GEM/ENV/09-M18. Faculty Advisor: Lt Col Alexander J. Barelka. Sponsor: 711 HPW/RH.

#### **AFRL: 711th HUMAN PERFORMANCE WING/USAFSAM**

##### **MASTER'S THESES**

BATTEN, TIMOTHY W., *Field Evaluation of a Novel Exposure Assessment Strategy Using Respirable Coal Dust Exposures During Heat Plant Coal Receiving Operations*. AFIT/GIH/ENV/09-M01. Faculty Advisor: Maj Jeremy M. Slagley. Sponsor: USAFSAM.

SCHMIDTGOESSLING, ROBERT D., *Shelter-In-Place: Indoor Exposure Assessment During an Airborne Chemical, Biological, Radiological, and Nuclear (CBRN) Event*. AFIT/GIH/ENV/09-M02. Faculty Advisor: Maj Jeremy M. Slagley. Sponsor: USAFSAM.

#### **AFRL: INFORMATION DIRECTORATE**

##### **MASTER'S THESES**

CARLOS GONZALEZ, JUAN M., *An Efficient and Effective Implementation of the Trust System for Power Grid Compartmentalization*. AFIT/GCS/ENG/09-01. Faculty Advisor: Dr. Kenneth M. Hopkinson. Sponsor: AFRL/RI.

DURHAM, CLIFTON M., *Evaluation of an OPNET Model for Unmanned Aerial Vehicle Networks*. AFIT/GCO/ENG/09-04. Faculty Advisor: Maj Todd R. Andel. Sponsor: AFRL/RI.

REESE, CINDY C., *Decisive Routing and Admission Control According to Quality of Service Constraints*. AFIT/GE/ENG/09-36. Faculty Advisor: Dr. Kenneth Hopkinson. Sponsor: AFRL/RI.

## **AFRL: MATERIALS AND MANUFACTURING DIRECTORATE**

### **DOCTORAL DISSERTATIONS**

KIM, TED T., *Thermo-Mechanical Characterization of Silicon Carbide-Silicon Carbide Composites at Elevated Temperatures Using a Unique Combustion Facility*. AFIT/DS/ENY/09-S01. Faculty Advisor: Dr. Shankar Mall. Sponsor: AFRL/RX & DAGSI.

STOIK, CHRISTOPHER D., *Nondestructive Evaluation of Aircraft Composites Using Terahertz Time Domain Spectroscopy*. AFIT/DS/ENP/09-D02. Faculty Advisor: Lt Col Matthew J. Bohn. Sponsor: AFRL/RX.

### **MASTER'S THESES**

GALLAGHER, DANIEL M., *Surface Acoustic Wave Devices as Chemical Vapor Sensors*. AFIT/GE/ENG/09-16. Faculty Advisor: Lt Col Ronald A. Coutu. Sponsor: AFRL/RX.

JOHNSON, JEREMY D., *Non-Destructive Evaluation of Aerospace Composites*. AFIT/GMS/ENP/09-M02. Faculty Advisor: Lt Col Matthew J. Bohn. Sponsor: AFRL/RX.

KUTSAL, TOLGA, *Effect of Steam Environment on Creep Behavior of Nextel720/Alumina-Mullite Ceramic Matrix Composite at Elevated Temperature*. AFIT/GSS/ENY/09-M03. Faculty Advisor: Dr. Marina B. Ruggles-Wrenn. Sponsor: AFRL/RX.

LAURVICK, TOD, *Chip to Chip Optical Interconnection Using MEMS Mirrors*. AFIT/GE/ENG/09-27. Faculty Advisor: Maj LaVern A. Starman. Sponsor: AFRL/RX.

OZER, MUZAFFER, *Effects of Environment on Creep Behavior of Nextel720/Alumina-Mullite Ceramic Composite with  $\pm 45^\circ$  Fiber Orientation at 1200°C*. AFIT/GSS/ENY/09-M05. Faculty Advisor: Dr. Marina B. Ruggles-Wrenn. Sponsor: AFRL/RX.

TATAR, JOHN J., *Wave Optics Simulation of Optically Augmented Retroreflections for Monostatic/Bistatic Detection*. AFIT/GEO/ENP/09-M03. Faculty Advisor: Dr. Michael Marciniak. Sponsor: AFRL/RX.

## **AFRL: MUNITIONS DIRECTORATE**

### **MASTER'S THESES**

BINGHAM, JASON K., *Vision-Aided Cooperative Navigation for Multiple Unmanned Vehicles*. AFIT/GE/ENG/09-05. Faculty Advisor: Lt Col Michael J. Veth. Sponsor: AFRL/RW.

COLEMAN, NICHOLAS R., *Micro-Scale Flapping Wings for the Advancement of Flying MEMS*. AFIT/GE/ENG/09-09. Faculty Advisor: Maj LaVern A. Starman. Sponsor: AFRL/RW.

FARRELL, SHANNON M., *Waypoint Generation Based on Sensor Aimpoint*. AFIT/GAE/ENV/09-M01. Faculty Advisor: Dr. David R. Jacques. Sponsor: AFRL/RW.

GRAY, JEFFREY R., *Deeply-Integrated Feature Tracking for Embedded Navigation*. AFIT/GE/ENG/09-17. Faculty Advisor: Lt Col Michael J. Veth. Sponsor: AFRL/RW.

GUBBELS, ADAM J., *Integrating Microelectromechanical Systems (MEMS) into Safe and Arming Devices*. AFIT/GE/ENG/09-18. Faculty Advisor: Maj LaVern A. Starman. Sponsor: AFRL/RW.

HENDRIX, CONSTANCE D., *Model-Based Control Using Model and Mechanization Fusion Techniques for Image-Aided Navigation*. AFIT/GE/ENG/09-19. Faculty Advisor: Lt Col Michael J. Veth. Sponsor: AFRL/RW.

LAGOSKI, THOMAS J., *Retroreflector for Photonic Doppler Velocimetry*. AFIT/EO/ENG/09-02. Faculty Advisor: Lt Col Ronald A. Coutu. Sponsor: AFRL/RW.

ROGERS, MARSHALL M., *An Investigation into the Feasibility of Using a Modern Gravity Gradient Instrument for Passive Aircraft Navigation and Terrain Avoidance*. AFIT/GAE/ENY/09-M16. Faculty Advisor: Maj Richard E. Huffman. Sponsor: AFRL/RY & AFRL/RW.

STORMS, WILLIAM F., *Magnetic Field Aided Indoor Navigation*. AFIT/GE/ENG/09-44. Faculty Advisor: Dr. John F. Raquet. Sponsor: AFRL/RW.

WIGGINS, ARUBEY M., *Tactical Targeting Network Technology (TTNT) Modeling: MATLAB Physical and OPNET Network Layer Consistency*. AFIT/GE/ENG/09-48. Faculty Advisor: Dr. Michael A. Temple. Sponsor: AFRL/RW.

### **AFRL: PROPULSION DIRECTORATE**

#### **DOCTORAL DISSERTATIONS**

FREEBORN, ANDREW B., *Pylon Effects on a Scramjet Cavity Flameholder Flowfield*. AFIT/DS/ENY/08-04. Faculty Advisor: Dr. Paul I. King. Sponsor: AFRL/RZ.

RUTLEDGE, JAMES L., *Pulsed Film Cooling on a Turbine Blade Leading Edge*. AFIT/DS/ENY/09-S03. Faculty Advisor: Dr. Paul I. King. Sponsor: AFRL/RZ.

#### **MASTER'S THESES**

AKINLEMIBOLA, BOLANLE, *The Systems Engineering Design of an Energy Prediction Tool*. AFIT/GSE/ENV/09J-01. Faculty Advisor: Dr. David R. Jacques. Sponsor: AFRL/RZ.

BAGG, MATTHEW G., *Computational Analysis of Geometric Effects on Strut Induced Mixing in a Scramjet Combustor*. AFIT/GAE/ENY/09-M01. Faculty Advisor: Dr. Robert Greendyke. Sponsor: AFRL/RZ.

COLLATZ, MACKENZIE J., *Performance and Operability of a Dual Cavity Flame Holder in a Supersonic Combustor*. AFIT/GSS/ENY/09-J01. Faculty Advisor: Lt Col Richard Branam. Sponsor: AFRL/RZ.

DeLEON, AMANDO, *A Finite Element Evaluation of an Experiment Related to Coating Damping Properties*. AFIT/GA/ENY/09-M03. Faculty Advisor: Dr. Anthony Palazotto. Sponsor: AFRL/RZ.

FRISINGER, PAUL G., *An Experimental Investigation Studying the Influence of Dimples on a Film Cooled Turbine Blade Leading Edge*. AFIT/GAE/ENY/09-M10. Faculty Advisor: Dr. Paul I. King. Sponsor: AFRL/RZ.

GILBERT, JONATHAN, *Direct Initiation of Multiple Tubes by Detonation Branching in a Pulsed Detonation Engine Using Hydrocarbon Fuels*. AFIT/GAE/ENY/09-M09. Faculty Advisor: Dr. Paul I. King. Sponsor: AFRL/RZ.

KARASZ, WILLIAM J., *Optimal Re-entry Trajectory Terminal State Due to Variations in Waypoint Locations*. AFIT/GA/ENY/08-D01. Faculty Advisor: Dr. Richard Cobb. Sponsor: AFRL/RZ.

MORGAN, BRYAN K., *Building of a Laser Diagnostic Tool to Measure the Ion Velocity in a Low Power Hall Thruster*. AFIT/GAE/ENY/09-M04. Faculty Advisor: Lt Col Richard Branam. Sponsor: AFRL/RZ.

OLMSTEAD, DELL T., *Cavity Coupled Aeroramp Injector Combustion Study*. AFIT/GAE/ENY/09-J03. Faculty Advisor: Lt Col Richard Branam. Sponsor: AFRL/RZ.

PIERCE, CHRISTIAN J., *Creep and Fatigue Interaction Characteristics of PWA1484*. AFIT/GMS/ENY/09-M02. Faculty Advisor: Dr. Anthony Palazotto. Sponsor: AFRL/RZ.

POHLMAN, MITCHELL R., *Critical Design Parameters for Pylon-Aided Gaseous Fuel Injection Upstream of a Flameholding Cavity*. AFIT/GAE/ENY/09-M15. Faculty Advisor: Dr. Robert B. Greendyke. Sponsor: AFRL/RZ.

ROTTER, JOHN E., *An Analysis of Multiple Configurations of Next-Generation Cathodes in a Low Power Hall Thruster*. AFIT/GA/ENY/09-M07. Faculty Advisor: Lt Col Richard Branam. Sponsor: AFRL/RZ.

SEO, MYEONGKYO, *Characterizing the Exhaust Plume of the Three-Electrode Micro Pulsed Plasma Thrusters*. AFIT/GSS/ENY/09-M07. Faculty Advisor: Lt Col Richard Branam. Sponsor: AFRL/RZ.

STEVENS, CHRISTOPHER A., *Fuel Composition and Performance Analysis of Endothermically Heated Fuels for Pulse Detonation Engines*. AFIT/GAE/ENY/09-M21. Faculty Advisor: Dr. Paul I. King. Sponsor: AFRL/RZ.

WILLIS, GARRET M., *Empirical Source Model Development for Hall Thruster Plasma Plume Characterization*. AFIT/GA/ENY/09-M09. Faculty Advisor: Lt Col Richard Branam. Sponsor: AFRL/RZ.

### **AFRL: SENSORS DIRECTORATE**

#### **DOCTORAL DISSERTATIONS**

BEARD, TODD W., *Application of Optimization Techniques to Spectrally Modulated, Spectrally Encoded Waveform Design*. AFIT/DEE/ENG/08-16. Faculty Advisor: Dr. Michael A. Temple. Sponsor: AFRL/RZ.

CARLS, JOHN W., *A Framework for Analyzing Biometric Template Aging and Renewal Prediction*. AFIT/DCS/ENG/09-07. Faculty Advisor: Dr. Richard A. Raines. Sponsor: AFRL/RZ.

FAROOQ, JAWAD, *Frequency Diversity for Improving Synthetic Aperture Radar Imaging*. AFIT/DEE/ENG/09-04. Faculty Advisor: Maj Michael A. Saville. Sponsor: AFRL/RZ.

KLEIN, RANDALL W., *Application of Dual-Tree Complex Wavelet Transforms to Burst Detection and RF Fingerprint Classification*. AFIT/DEE/ENG/09-12. Faculty Advisor: Dr. Michael A. Temple. Sponsor: AFRL/RZ.

#### **MASTER'S THESES**

ALTIN, GOKHAN, *Bit-Error-Rate-Minimizing Channel Shortening Using Post-FEQ Diversity Combining and a Genetic Algorithm*. AFIT/GE/ENG/09-01. Faculty Advisor: Dr. Richard K. Martin. Sponsor: AFRL/RZ.

ANTKOVIK, JASON L., *Uncertainty Estimate for Near Field to Far Field Transform Algorithm*. AFIT/GE/ENG/09-03. Faculty Advisor: Dr. Peter J. Collins. Sponsor: AFRL/RZ.

BALLING, BRADLEY, *A Comparative Study of the Bidirectional Reflectance Distribution Function of Several Surfaces as a Mid-wave Infrared Diffuse Reflectance Standard*. AFIT/GE/ENP/09-M01. Faculty Advisor: Dr. Michael Marciniak. Sponsor: AFRL/RZ.

BOWEN, SPENCER J., *Hyperspectral Imaging of a Turbine Engine Exhaust Plume to Determine Radiance, Temperature, and Concentration Spatial Distributions*. AFIT/GAP/ENP/09-M02. Faculty Advisor: Dr. Michael Marciniak. Sponsor: AFRL/RZ.

CRANE, JAMES H., *Full-Wave Based Validation of Stripline Field Applicator for Low Frequency Material Measurements*. AFIT/GE/ENG/09-10. Faculty Advisor: Dr. Michael J. Havrilla. Sponsor: AFRL/RZ.



CROSBY, JASON, *Fusion of Inertial Sensors and Orthogonal Frequency Division Multiplexed (OFDM) Signals of Opportunity for Unassisted Navigation*. AFIT/GE/ENG/09-11. Faculty Advisor: Dr. Richard K. Martin. Sponsor: AFRL/Ry.

DONNELL, BRIAN P., *Using Shadows to Detect Targets in Synthetic Aperture Radar Imagery*. AFIT/GE/ENG/09-12. Faculty Advisor: Maj Michael J. Mendenhall. Sponsor: AFRL/Ry.

GRAY, ZACHARY C., *Communication Free Robot Swarming*. AFIT/GCE/ENG/09-03. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: AFRL/Ry.

HONORE, AUGUSTINE A., *Implementation of Collaborative RF Localization Using a Software-Defined Radio Network*. AFIT/GE/ENG/09-20. Faculty Advisor: Capt Ryan W. Thomas. Sponsor: AFRL/Ry.

HOWARD, TORSTEN E., *Abstracting GIS Layers from Hyperspectral Imagery*. AFIT/GE/ENG/09-21. Faculty Advisor: Maj Michael Mendenhall. Sponsor: AFRL/Ry.

JORDAN, STEVEN P., *Range Estimation Algorithm Comparison in 3-D Flash LADAR Data*. AFIT/GE/ENG/09-22. Faculty Advisor: Dr. Stephen C. Cain. Sponsor: AFRL/Ry.

KEEN, JONATHAN K., *Low Probability of Intercept Waveforms Via Intersymbol Dither Performance Under Multipath Conditions*. AFIT/GE/ENG/09-23. Faculty Advisor: Dr. Richard K. Martin. Sponsor: AFRL/Ry.

KEICHEL, WILLIAM, *Two Dimensional Scattering Analysis of Data-Linked Support Strings for Bistatic Measurement Systems*. AFIT/GE/ENG/09-24. Faculty Advisor: Dr. Peter Collins. Sponsor: AFRL/Ry.

KIMBALL, WILLIAM A., *SecureQEMU: Emulation-based Software Protection Providing Encrypted Code Execution and Page Granularity Code Signing*. AFIT/GCO/ENG/09-03. Faculty Advisor: Dr. Rusty Baldwin. Sponsor: AFRL/Ry.

LEDET, MARY M., *Utilizing Microelectromechanical Systems (MEMS) Micro-Shutter Designs for Adaptive Coded Aperture Imaging (ACAI) Technologies*. AFIT/GEO/ENG/09-03. Faculty Advisor: Maj LaVern A. Starman. Sponsor: AFRL/Ry.

LIN, STEPHEN S., *Unified Behavior Framework in an Embedded Robot Controller*. AFIT/GCE/ENG/09-04. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: AFRL/Ry.

MUSTER, RICHARD T., *Exploitation of Geographic Information Systems for Vehicular Destination Prediction*. AFIT/GCE/ENG/09-05. Faculty Advisor: Maj Michael Mendenhall. Sponsor: AFRL/Ry.

MUTLU, GUNER, *The Navigation Potential of Ground Feature Tracking*. AFIT/GE/ENG/09-52. Faculty Advisor: Dr. Meir Pachter. Sponsor: AFRL/Ry.

PORTER, ROY A., *Critical Technology Tamper Protection Through Dynamic Polymorphic Reconfiguration*. AFIT/GCE/ENG/09-08. Faculty Advisor: Dr. Yong C. Kim. Sponsor: AFRL/Ry.

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ROSAL, JOSEPH D., *Centralized Cooperative Control for Route Surveillance with Constant Communication*. AFIT/GE/ENG/09-38. Faculty Advisor: Lt Col Gregory J. Toussaint. Sponsor: AFRL/Ry.

SCHMITT, ASHLEY L., *Radar Imaging With a Network of Digital Noise Radar Systems*. AFIT/GE/ENG/09-39. Faculty Advisor: Dr. Peter J. Collins. Sponsor: AFRL/Ry.

SCHMITT, DANIEL T., *Automated Knowledge Generation With Persistent Surveillance Video*. AFIT/GCS/ENG/09-06. Faculty Advisor: Lt Col Stuart Kurkowski. Sponsor: AFRL/Ry.

SCHULTZ, ADAM M., *Low Frequency Synthesis Through Wavelet Optimization*. AFIT/GE/ENG/09-40. Faculty Advisor: Dr. Peter Collins. Sponsor: AFRL/Ry.

SEARLES, EVAN T., *A Phenomenological Investigation of Synthetic Waveform Features for Non-Cooperative Exploitation*. AFIT/GE/ENG/09-41. Faculty Advisor: Dr. Michael A. Temple. Sponsor: AFRL/Ry.

SEYMOUR, RICHARD S., *The Trust-Based Interactive Partially Observable Markov Decision Process*. AFIT/GCS/ENG/09-09. Faculty Advisor: Dr. Gilbert Peterson. Sponsor: AFRL/Ry.

SHILLAND, GLEN R., *Host-Based Multivariate Statistical Computer Operating Process Anomaly Intrusion Detection System (PAIDS)*. AFIT/GOR/ENS/09-15. Faculty Advisor: Dr. Kenneth W. Bauer. Sponsor: AFRL/Ry.

SMITH, AUSTIN L., *UAS Collision Avoidance Algorithm that Minimizes the Impact on Route Surveillance*. AFIT/GAE/ENY/09-M18. Faculty Advisor: Lt Col Frederick G. Harmon. Sponsor: AFRL/Ry.

SMITH, MICHAEL J., *Electronic Image Stabilization for Mobile Robotic Vision Systems*. AFIT/GE/ENG/09-53. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: AFRL/Ry.

TANNER, MICHAEL A., *Image Processing for Multiple-Target Tracking on a Graphics Processing Unit*. AFIT/GCE/ENG/09-11. Faculty Advisor: Dr. Yong C. Kim. Sponsor: AFRL/Ry.

THEIS, NICHOLAS C., *The Modular Clock Algorithm for Blind Rendezvous*. AFIT/GCS/ENG/09-08. Faculty Advisor: Capt Ryan W. Thomas. Sponsor: AFRL/Ry.

WARD, DANIEL B., *The Effect of Values on System Development Project Outcomes*. AFIT/GSE/ENV/09-M08. Faculty Advisor: Dr. Dennis Strouble. Sponsor: AFRL/Ry.

WEAVER, ADAM D., *Using Predictive Rendering as a Vision-Aided Technique for Autonomous Aerial Refueling*. AFIT/GE/ENG/09-45. Faculty Advisor: Lt Col Michael J. Veth. Sponsor: AFRL/Ry.

WEBBER, FREDERICK C., *Precision Navigation Using Pre-Georegistered Map Data*. AFIT/GE/ENG/09-54. Faculty Advisor: Lt Col Michael J. Veth. Sponsor: AFRL/Ry.

WITTHOEFT, BRIAN J., *Suite of Standards for Electromagnetic Material Characterization Using Mode Matching Theory*. AFIT/GE/ENG/09-49. Faculty Advisor: Dr. Michael J. Havrilla. Sponsor: AFRL/Ry.

#### **GRADUATE RESEARCH PAPERS**

DIAMOND, THEODORE T., RUTHERFORD, ADAM L., and TAYLOR, JONATHAN B., *Cooperative Unmanned Aerial Surveillance Control System Architecture*. AFIT/GSE/ENV/09-M07. Faculty Advisor: Dr. David R. Jacques. Sponsor: AFRL/Ry & AFRL/RB.

INSLEY, DARRYL L., McKELLAR, BRIAN D., and VON DER FELSEN, JAN, *Linking Interoperability Characters and Measures of Effectiveness: A Methodology for Evaluating Architectures*. AFIT/ISE/ENV/09-J01. Faculty Advisor: Dr. David R. Jacques. Sponsor: AFRL/Ry.

McKELLAR, BRIAN D., See INSLEY, DARRYL L.

RUTHERFORD, ADAM L., See DIAMOND, THEODORE T.

TAYLOR, JONATHAN B., See DIAMOND, THEODORE T.

VON DER FELSEN, JAN, See INSLEY, DARRYL L.

#### **AFRL: SPACE VEHICLES DIRECTORATE**

##### **MASTER'S THESES**

McFARLAND, CHESTER D., *Near Real-Time Closed-Loop Optimal Control Feedback for Spacecraft Attitude Maneuvers*. AFIT/GA/ENY/09-M06. Faculty Advisor: Lt Col Eric D. Swenson. Sponsor: AFRL/RV.

SIMMONS, THOMAS E., *Characterization of Hardening by Design Techniques on Commercial, Small Feature Sized Field-Programmable Gate Arrays*. AFIT/GE/ENG/09-43. Faculty Advisor: Dr. Yong C. Kim. Sponsor: AFRL/RV.

WITT, BARRY R., *Mission Planning for Close-Proximity Satellites*. AFIT/GA/ENY/09-M10. Faculty Advisor: Dr. William Wiesel. Sponsor: AFRL/RV.

#### **AIR FORCE SEEK EAGLE OFFICE**

##### **MASTER'S THESES**

FERGUSON, IAIN D.M., *Aerodynamic and Structural Modeling Effects on Subsonic Flutter Prediction for F-16 Store Configuration Clearance*. AFIT/GAE/ENY/09-M08. Faculty Advisor: Dr. Robert A. Canfield. Sponsor: AFSEO.

#### **ARNOLD ENGINEERING DEVELOPMENT CENTER**

##### **MASTER'S THESES**

LEGGIO, DEREK A., *Examining Methods to Reduce Wind Tunnel Test Data Requirements Using the Design of Experiments (DOE)*. AFIT/GOR/ENS/09-08. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: AEDC/XP.

#### **ELECTRONIC SYSTEMS CENTER**

##### **MASTER'S THESES**

COTTON, D. LARRY and HAASE, GARRY A., *Value-Driven Enterprise Architecture Score: Evaluation Applied to Joint Force Protection Future State Design*. AFIT/GSE/ENV/09-M03. Faculty Advisor: Maj Jeffrey D. Havlicek. Sponsor: AFMC/ESC.

HAASE, GARRY A., See COTTON, D. LARRY.

LECHNER, KRISTINA, *Evaluation of High Confidence Criteria Using a Case Study of the Multi-Platform Radar Technology Insertion Program*. AFIT/GRD/ENV/09-M03. Faculty Advisor: Dr. Alfred E. Thal Jr. Sponsor: ESC/CC.

MILLS, CRAIG E., *Value-Driven Enterprise Architecture Evaluation for the Joint Force Protection Advanced Security System*. AFIT/GEM/ENV/09-M13. Faculty Advisor: Dr. Alfred E. Thal Jr. Sponsor: AFMC/ESC.

OSGOOD, JUSTIN W., *Methodology for Value-Driven Enterprise Architecture Development Goals: Application to DoDAF Framework*. AFIT/GEM/ENV/09-M16. Faculty Advisor: Dr. Alfred E. Thal Jr. Sponsor: AFMC/ESC.

## **AIR FORCE TEST PILOT SCHOOL**

### **MASTER'S THESES**

BROWNING, JOSEPH S., *F-16 Ventral Fin Buffet Alleviation Using Piezoelectric Actuators*. AFIT/GAE/ENY/09-S01. Faculty Advisor: Dr. Richard Cobb. Sponsor: USAF TPS.

WILLIAMS, MICHAEL D., *Wind Tunnel Analysis and Flight Test of a Wing Fence on a T-38*. AFIT/GAE/ENY/09-M20. Faculty Advisor: Dr. Mark F. Reeder. Sponsor: USAF TPS.

## **4.7. AIR FORCE SPECIAL OPERATIONS COMMAND**

### **MASTER'S THESES**

GEYER, ANDREW J., *Operations-Focused Optimized Theater Weather Sensing Strategies Using Preemptive Binary Integer Programming*. AFIT/GOR/ENS/09-06. Faculty Advisor: Maj Shane N. Hall. Sponsor: AFSOC.

### **GRADUATE RESEARCH PAPERS**

ROWE, RYAN L., *Optimal CV-22 Centralized Intermediate Repair Facility Locations and Parts Repair*. AFIT/ILS/ENS/09C-04. Faculty Advisor: Dr. William A. Cunningham. Sponsor: AFSOC.

## **4.8. AIR MOBILITY COMMAND**

### **MASTER'S THESES**

HAMMOND, GREGORY D., *Perceived Need for Change: A Test of Individual Emotion and Contextual Influences*. AFIT/GEM/ENV/09-M06. Faculty Advisor: Lt Col Dean Vitale. Sponsor: HQ AMC.

HEIMAN, THEODORE K., *Simulation Modeling of the C-5 Galaxy High Velocity Regionalized Isochronal (HVRISO) Inspection Concept*. AFIT/GLM/ENS/09-6. Faculty Advisor: Dr. Alan W. Johnson. Sponsor: HQ AMC.

NANCE, ROBERT L., *An Advanced Tabu Search Approach to Solving the Mixed Payload Airlift Load Planning Problem*. AFIT/GOR/ENS/09-11. Faculty Advisor: Maj August G. Roesener. Sponsor: HQ AMC.

### **GRADUATE RESEARCH PAPERS**

BURGESS, JAMES E., *Fuel Savings of Removing the C-130 External Tanks*. AFIT/IMO/ENS/09-1. Faculty Advisor: Dr. William A. Cunningham. Sponsor: HQ AMC.

LANIER, CHRISTOPHER M., *Implementing Supply Chain Management: Synchronizing Cargo Movement From the United States to Iraq*. AFIT/IMO/ENS/09-3. Faculty Advisor: Maj Ben Skipper. Sponsor: HQ AMC.

LEW, SCOTT S., *Analysis of Civil Reserve Airfleet Participation*. AFIT/IMO/ENS/09-4. Faculty Advisor: Lt Col Pamela S. Donovan. Sponsor: HQ AMC.

MATHERNE, RAY P., *Fuel Saving Through Aircraft Modification: A Cost Analysis*. AFIT/IMO/ENS/09-7. Faculty Advisor: Dr. James T. Moore. Sponsor: HQ AMC.

MAZZARA, DAVID J., *Automated Air Refueling Cost Benefit Analysis*. AFIT/IMO/ENS/09-8. Faculty Advisor: Dr. James T. Moore. Sponsor: HQ AMC.

NICHOLSON JR., JAMES B., *Bio-Fuels for Air Mobility Command Assets: The Way Ahead*. AFIT/IMO/ENS/09-10. Faculty Advisor: Lt Col Bradley E. Anderson. Sponsor: HQ AMC.

O'BRIEN, PATRICK H., *TWCF for Tankers*. AFIT/IMO/ENS/09-11. Faculty Advisor: Dr. James T. Moore. Sponsor: HQ AMC.

REAGAN, KIRK L., *C-130 Airdrop/Formation Crew Qualifications*. AFIT/IMO/ENS/09-12. Faculty Advisor: Dr. James T. Moore. Sponsor: HQ AMC.

REIMAN, ADAM D., *Hydrogen Aircraft Technology*. AFIT/IMO/ENS/09-13. Faculty Advisor: Lt Col Bradley E. Anderson. Sponsor: HQ AMC.

TRINKLEIN, ALLISON M., *Reengineering the Tanker Allocation Process*. AFIT/IMO/ENS/09-15. Faculty Advisor: Dr. Alan Heminger. Sponsor: HQ AMC.

## **4.9. AIR FORCE SPACE COMMAND**

### **24th AIR FORCE**

#### **MASTER'S THESES**

MOORE, THOMAS W., *Recommendations for Conducting a Legal Review for Network Attack Weapon Acquisitions*. AFIT/GCO/ENV/09-M01. Faculty Advisor: Dr. Michael G. Grimaila. Sponsor: AFCYBER.

MURPHY, SHERRY B., *Deceiving Adversary Network Scanning Efforts Using Host-Based Deception*. AFIT/ICW/ENG/09-04. Faculty Advisor: Lt Col Jeffrey McDonald. Sponsor: AFCYBER.

### **61st AIR BASE WING**

#### **MASTER'S THESES**

MOBLEY, GARLAND T., *An Investigation of Knowledge Transfer and Retention in a Government Procurement Office*. AFIT/GSS/ENV/09-M01. Faculty Advisor: Dr. Alan Heminger. Sponsor: SMC/MCSW.

## **4.10. USAF FIELD OPERATING AGENCIES**

### **84th RADAR EVALUATION SQUADRON**

#### **MASTER'S THESES**

AMATO, NICHOLAS J., *Modeling and Simulation Architecture for Studying Doppler-Based Radar With Complex Environments*. AFIT/GE/ENG/09-02. Faculty Advisor: Maj Michael A. Saville. Sponsor: 84 RADES.

BRAND, PAUL M., *Modeling of Wind Turbine Doppler Effects on Primary Search Radar*. AFIT/GE/ENG/09-07. Faculty Advisor: Maj Michael Mendenhall. Sponsor: 84 RADES.

### **AIR FORCE ACADEMY**

#### **MASTER'S THESES**

ANTOSH, CORY J., *The Evaluation of Rekeying Protocols Within the Hubenko Architecture as Applied to Wireless Sensor Networks*. AFIT/GE/ENG/ENG/09-04. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: USAFA/DFEC.

DOUPE, COLE C., *Finite Element Model Optimization of the FalconSAT-5 Structural Engineering Model*. AFIT/GA/ENY/09-M04. Faculty Advisor: Lt Col Eric D. Swenson. Sponsor: USAFA/DFAS.

#### **AIR FORCE INFORMATION OPERATIONS CENTER**

##### **MASTER'S THESES**

GONZALEZ, JOSE A., *Numerical Analysis for Relevant Features in Intrusion Detection (NARFid)*. AFIT/GCE/ENG/09-02. Faculty Advisor: Maj Michael Mendenhall. Sponsor: AFIOC.

SCHRADER, KARL R., *An FPGA-Based System for Tracking Digital Information Transmitted Via Peer-to-Peer Protocols*. AFIT/GCE/ENG/09-10. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: AFIOC.

#### **AIR FORCE PERSONNEL CENTER**

##### **MASTER'S THESES**

BARNUM, JOSEPH M., *Analysis of the Military Medical Retirement System*. AFIT/GCA/ENV/09-M01. Faculty Advisor: Lt Col Eric J. Unger. Sponsor: AFPC/DPSD.

TORTELLA, JOSEPH A., *Operations Tempo and Turnover Intentions: An Exploratory Study of the Air Force's Explosive Ordnance Disposal (EOD) Career Field and Development of the Air Force Civil Engineer Retention Questionnaire*. AFIT/GEM/ENV/09-M17. Faculty Advisor: Lt Col Daniel T. Holt. Sponsor: HQ AFPC.

#### **AIR FORCE WEATHER AGENCY**

##### **MASTER'S THESES**

ECHEVERRIA, FRANCESCO J., *Assessment of Weather Sensitivites and Air Force Weather (AFW) Support to Tactical Lasers in the Lower Troposphere*. AFIT/GAP/ENP/09-M05. Faculty Advisor: Lt Col Steven T. Fiorino. Sponsor: AFWA.

MAREK, SETH L., *A Computational Tool for Evaluating THz Imaging Performance in Brownout Conditions at Land Sites Throughout the World*. AFIT/GAP/ENP/09-M08. Faculty Advisor: Lt Col Steven T. Fiorino. Sponsor: AFWA.

TUCKER, DANIEL, *An Assessment of the Air Force Weather Agency's Readiness for Knowledge Management Initiatives*. AFIT/GIR/ENV/09-M04. Faculty Advisor: Maj Todd A. Peachey. Sponsor: AFWA/CCC.

## **4.11. PACIFIC AIR FORCES**

##### **MASTER'S THESES**

VAN DEN TOP, TRICIA A., *Small Business Programs: Benefits, Barriers, Bridges and Critical Success Factors*. AFIT/ILS/ENS/09C-06. Faculty Advisor: Dr. Jeffrey A. Ogden. Sponsor: HQ PACAF.

## **4.12. DEPARTMENT OF DEFENSE**

### **DEFENSE THREAT REDUCTION AGENCY**

#### **MASTER'S THESES**

BELL, LATOSHA M., *Effect of Advanced Synthetically Enhanced Detector Resolution Algorithm on Specificity and Sensitivity of Portable High Purity Germanium Gamma Detector Spectra*. AFIT/GNE/ENP/09-J01. Faculty Advisor: Dr. James C. Petrosky. Sponsor: DTRA.

KOEHL, MICHAEL A., *Thermal Flash Simulator*. AFIT/GNE/ENP/09-M04. Faculty Advisor: Dr. Larry Burggraf. Sponsor: DTRA.

MORAN, JEFFREY T., *The Effects of Temperature and Electron Radiation on the Electrical Properties of AlGaIn/GaN Heterostructure Field Effect Transistors*. AFIT/GNE/ENP/09-M04. Faculty Advisor: Lt Col John W. McClory. Sponsor: DTRA.

O'DAY, BUCKLEY E., *Estimation of Weapon Yield From Inversion of Dose Rate Contours*. AFIT/GNE/ENP/09-M05. Faculty Advisor: Lt Col Steven T. Fiorino. Sponsor: DTRA.

ROCKROHR, RANDALL L., *Determining SNM Source Position Using Gamma Spectra from a Portable High Purity Germanium Detector*. AFIT/GNE/ENP/09-M06. Faculty Advisor: Dr. Larry Burggraf. Sponsor: DTRA.

VILLAFUERTE, JULIO, *Determining Source and Shielding of Suspected Special Nuclear Material Configurations Using a Portable High Purity Germanium Detector*. AFIT/GNE/ENP/09-J02. Faculty Advisor: Dr. James C. Petrosky. Sponsor: DTRA.

### **HIGH ENERGY LASER JOINT TECHNOLOGY OFFICE**

#### **MASTER'S THESES**

COHEN, J. JEAN, *Demonstration and Verification of a Broad Spectrum Anomalous Dispersion Effects Tool for Index of Refraction and Optical Turbulence Calculations*. AFIT/GAP/ENP/09-M03. Faculty Advisor: Lt Col Steven T. Fiorino. Sponsor: HEL-JTO.

LEWIS II, CHARLTON D., *Theoretical Model Analysis of Absorption of a Three Level Diode Pumped Alkali Laser*. AFIT/GAP/ENP/09-M07. Faculty Advisor: Dr. Glen P. Perram. Sponsor: HEL-JTO.

### **JOINT ELECTRONIC PROTECTION FOR AIR COMBAT**

#### **GRADUATE RESEARCH PAPERS**

FINO, STEVEN A., *The Effect of Pilot Experience and Training on Air Combat in an Advanced Electronic Attack Environment: A Quantitative Analysis*. AFIT/IOA/ENS/09-01. Faculty Advisor: Dr. Raymond Hill. Sponsor: JEPAC.

### **JOINT IMPROVISED EXPLOSIVE DEVICE DEFEAT ORGANIZATION**

#### **MASTER'S THESES**

RICHARDS, CHRISTOPHER D., *Creating Multi Objective Value Functions From Non-Independent Values*. AFIT/GOR/ENS/09-12. Faculty Advisor: Dr. Jeffrey Weir. Sponsor: JIEDDO.

WILLY, CHRISTINA J., *Robust Sensitivity Analysis for the Joint Improvised Explosive Device Defeat Organization (JIEDDO) Proposal Selection Model*. AFIT/GOR/ENS/09-17. Faculty Advisor: Dr. Kenneth W. Bauer. Sponsor: JIEDDO.

## **NATIONAL SECURITY AGENCY**

### **DOCTORAL DISSERTATIONS**

KELLY, DOUGLAS J., *A Taxonomy for and Analysis of Anonymous Communications Networks*. AFIT/DCS/ENG/09-08. Faculty Advisor: Dr. Richard A. Raines. Sponsor: NSA.

### **MASTER'S THESES**

BIRCHENOUGH, DENNIS R., *Classifying Emissions from GSM Communication Devices Using Entropy-Based RF Fingerprinting*. AFIT/GE/ENG/09-06. Faculty Advisor: Dr. Michael A. Temple. Sponsor: NSA.

REISING, DONALD R., *Classifying Emissions from Global System for Mobile (GSM) Communication Devices Using Radio Frequency (RF) Fingerprints*. AFIT/GE/ENG/09-37. Faculty Advisor: Dr. Michael A. Temple. Sponsor: NSA.

HOLLOWAY, ERIC M., *Self Organized Multi Agent Swarms (SOMAS) for Network Security Control*. AFIT/GCS/ENG/09-02. Faculty Advisor: Dr. Gary B. Lamont. Sponsor: NSA.

WOELFLE, MICHAEL T., *Bluetooth Radio Frequency (RF) Waveform Analysis and Classification Using RF Fingerprints*. AFIT/GCO/ENG/09-06. Faculty Advisor: Dr. Michael Temple. Sponsor: NSA.

## **OFFICE OF SECRETARY OF DEFENSE**

### **MASTER'S THESES**

DOWNEN, MAUREEN A., *Evaluation of an Innovative Technology for Treatment of Water Contaminated With Perchlorate and Organic Compounds*. AFIT/GEM/ENV/09-M04. Faculty Advisor: Dr. Mark N. Goltz. Sponsor: OSD/ATL.

## **UNITED STATES AFRICA COMMAND**

### **GRADUATE RESEARCH PAPERS**

ULMER, THOMAS R., *Adaptive Logistics Network for AFRICOM*. AFIT/IMO/ENS/09-16. Faculty Advisor: Dr. James T. Moore. Sponsor: AFRICOM.

## **UNITED STATES CENTRAL COMMAND**

### **MASTER'S THESES**

CHANEY, ANDREW D., *Project Scheduling to Maximize Positive Impacts of Reconstruction Operations*. AFIT/GOR/ENS/09-03. Faculty Advisor: Dr. Richard F. Deckro. Sponsor: USCENTCOM.

## **UNITED STATES NAVY**

### **MASTER'S THESES**

BROWNING, DAVID W., *Analysis of the EA-6B Power Trim Indicator (PTI) System*. AFIT/GAE/ENY/08-D04. Faculty Advisor: Dr. Paul I. King. Sponsor: NAVAIR.



## **UNITED STATES TRANSPORTATION COMMAND**

### **GRADUATE RESEARCH PAPERS**

LUX, BARTON S., *Denton Cargo Process*. AFIT/IMO/ENS/09-5. Faculty Advisor: Dr. William A. Cunningham. Sponsor: USTRANSCOM.

### **4.13. NON-FEDERAL SPONSORS**

## **BALL AEROSPACE AND TECHNOLOGIES CORPORATION**

### **MASTER'S THESES**

JESSE, NEIL R., *Satellite-Based Fusion of Image/Inertial Sensors for Precise Geolocation*. AFIT/EO/ENG/09-04. Faculty Advisor: Lt Col Michael J. Veth. Sponsor: Ball Aerospace & Technologies Corp.

## **DAYTON PUBLIC SCHOOLS TRANSPORTATION CENTER**

### **MASTER'S THESES**

WOODS, FRANKIE L., *A Cost Assessment of the Dayton Public Schools Vehicle Routing Problem*. AFIT/GOR/ENS/09-18. Faculty Advisor: Dr. Jeffrey Weir. Sponsor: Dayton Public Schools Transportation Center.

## **DAYTON AREA GRADUATE STUDIES INSTITUTE**

### **DOCTORAL DISSERTATIONS**

KIM, TED T., *Thermo-Mechanical Characterization of Silicon Carbide-Silicon Carbide Composites at Elevated Temperatures Using a Unique Combustion Facility*. AFIT/DS/ENY/09-S01. Faculty Advisor: Dr. Shankar Mall. Sponsor: AFRL/RX & DAGSI.

## **OKLAHOMA STATE UNIVERSITY**

### **MASTER'S THESES**

McGILL, DAPHNE R., *Task-Technology Fit Assessment of an Expertise Transfer System*. AFIT/GIR/ENV/09-M02. Faculty Advisor: Maj Todd A. Peachey. Sponsor: Oklahoma State University.

## **RAYTHEON**

### **MASTER'S THESES**

ERNSBERGER, PATRIC J., *Performance Enhancements of Ranging Radio Aided Navigation*. AFIT/GE/ENG/09-15. Faculty Advisor: Dr. John Raquet. Sponsor: Raytheon.

## **REPUBLIC OF KOREA ARMY**

### **MASTER'S THESES**

CHO, MIN CHEOL, *An Analysis of Class II Supplies Requisitions in the Korean Army's Organizational Supply*. AFIT/GLM/ENS/09-04. Faculty Advisor: Lt Col Bradley E. Anderson. Sponsor: ROKA.

## **SOUTHERN UTAH UNIVERSITY**

### **MASTER'S THESES**

TRAHAN, ELIZABETH N., *An Evaluation of Growth Models as Predictive Tools for Estimates at Completion (EAC)*. AFIT/GFA/ENC/09-01. Faculty Advisor: Dr. Edward D. White. Sponsor: Southern Utah University.

## **TURKISH AIR FORCE**

### **MASTER'S THESES**

ARSLAN, OKAN, *Developing a Tool for the Location Optimization of the Alert Aircraft with Changing Threat Anticipation*. AFIT/GOR/ENS/09-02. Faculty Advisor: Dr. James T. Moore. Sponsor: TuAF.

SARIKAYA, NEBI, *Determining the Orbit Locations of Turkish Airborne Early Warning and Control Aircraft Over the Turkish Air Space*. AFIT/GOR/ENS/09-14. Faculty Advisor: Dr. James T. Moore. Sponsor: TuAF.

## **UNIVERSITY OF CINCINNATI**

### **MASTER'S THESES**

SWEENEY, DANIEL D., *Controlling Hazardous Noise and Dust Within the Industrial Workforce Using a Simple Barrier*. AFIT/GIH/ENV/09-M03. Faculty Advisor: Maj Jeremy M. Slagley. Sponsor: University of Cincinnati.

## **UNIVERSITY OF DAYTON**

### **MASTER'S THESES**

McCOMB, JERROD P., *A Metagenomic Analysis of Microbial Contamination in Aviation Fuels*. AFIT/GEM/ENV/09-M11. Faculty Advisor: Dr. Charles Beckmann. Sponsor: University of Dayton.

## **5. ACADEMIC DEPARTMENT PUBLICATIONS AND FUNDING INFORMATION**

## **5.1. DEPARTMENT OF AERONAUTICS AND ASTRONAUTICS**

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<b>5.1.1</b>	<b><u>DOCTORAL DISSERTATIONS</u></b>	<b>47</b>
<b>5.1.2</b>	<b><u>MASTER'S THESES</u></b>	<b>47</b>
<b>5.1.3</b>	<b><u>FACULTY RESEARCH OUTPUT</u></b>	<b>51</b>

### 5.1.1. DOCTORAL DISSERTATIONS

BOND, VANESSA L., *Flexible Twist for Pitch Control in a High Altitude Long Endurance Aircraft with Nonlinear Response*. AFIT/DS/ENY/08-D11. Faculty Advisor: Dr. Robert A. Canfield. Sponsor: AFRL/RB.

FREEBORN, ANDREW B., *Pylon Effects on a Scramjet Cavity Flameholder Flowfield*. AFIT/DS/ENY/08-04. Faculty Advisor: Dr. Paul I. King. Sponsor: AFRL/RZ.

KIM, TED T., *Thermo-Mechanical Characterization of Silicon Carbide-Silicon Carbide Composites at Elevated Temperatures Using a Unique Combustion Facility*. AFIT/DS/ENY/09-S01. Faculty Advisor: Dr. Shankar Mall. Sponsor: AFRL/RX & DAGSI.

McCLUNG, AARON M., *Influence of Structural Flexibility on Flapping Wing Propulsion*. AFIT/DS/ENY/09-J01. Faculty Advisor: Lt Col Raymond C. Maple. Sponsor: AFOSR & AFRL/RB.

McCLUNG, AMBER J., *Extension of Viscoplasticity Based on Overstress to Capture the Effects of Prior Aging on the Time Dependent Deformation Behavior of a High-Temperature Polymer: Experiments and Modeling*. AFIT/DS/ENY/08/D15. Faculty Advisor: Dr. Marina B. Ruggles-Wrenn. Sponsor: N/A.

RASMUSSEN, CODY C., *Least-Squares Finite Element Formulation for Fluid-Structure Interaction*. AFIT/DS/ENY/09-M16. Faculty Advisor: Dr. Robert A. Canfield. Sponsor: AFRL/RB.

RUTLEDGE, JAMES L., *Pulsed Film Cooling on a Turbine Blade Leading Edge*. AFIT/DS/ENY/09-S03. Faculty Advisor: Dr. Paul I. King. Sponsor: AFRL/RZ.

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### 5.1.2. MASTER'S THESES

ALEMAN, SALVADOR, *Satellite Reentry Control Via Surface Area Amplification*. AFIT/GSS/ENY/09-M01. Faculty Advisor: Dr. William E. Wiesel. Sponsor: N/A.

BAGG, MATTHEW G., *Computational Analysis of Geometric Effects on Strut Induced Mixing in a Scramjet Combustor*. AFIT/GAE/ENY/09-M01. Faculty Advisor: Dr. Robert Greendyke. Sponsor: AFRL/RZ.

BENTLEY, BROOK I., *An Investigation of Shock Wave Physics Via Hybrid CFD-BGK Solution Methods for Nonequilibrium Flows*. AFIT/GAE/ENY/09-M02. Faculty Advisor: Dr. Robert Greendyke. Sponsor: AFRL/RB.

BLAKE, RYAN, *Boundary Avoidance Tracking: Consequences (and Uses) of Imposed Boundaries on Pilot-Aircraft Performance*. AFIT/GAE/ENY/09-M03. Faculty Advisor: Lt Col Paul Blue. Sponsor: AFMC/412th TW.

BOOTH, CHRISTOPHER E., *Surveillance Using Multiple Unmanned Aerial Vehicles*. AFIT/GSS/ENY/09-M02. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: N/A.

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CARLTON, CHRISTOPHER L., *Lucky Imaging of Low Earth Orbit Satellites*. AFIT/GA/ENY/09-M01. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: N/A.

COLDSNOW, MATTHEW W., *Alternative Methods to Standby Gain Scheduling Following Air Data System Failure*. AFIT/GAE/ENY/09-S02. Faculty Advisor: Lt Col Paul A. Blue. Sponsor: N/A.

COLLATZ, MACKENZIE J., *Performance and Operability of a Dual Cavity Flame Holder in a Supersonic Combustor*. AFIT/GSS/ENY/09-J01. Faculty Advisor: Lt Col Richard Branam. Sponsor: AFRL/RZ.

COOPER, BRETT J., *Rigidizable Inflatable Get-Away-Special Experiment (RIGEX) Post Flight Analysis, Ground Testing, Modeling, and Future Applications*. AFIT/GA/ENY/09-M02. Faculty Advisor: Dr. Jonathan Black. Sponsor: N/A.

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CRAFT, CHRISTOPHER T., *Formation Flight of Earth Satellites on KAM Tori*. AFIT/GA/ENY/09-S01. Faculty Advisor: Dr. William E. Wiesel. Sponsor: N/A.

CROSCURTIS, DAVID H., *Laser Dot Projection Photogrammetry and Force Balance Measurement Techniques for Flapping Wing Micro Air Vehicles*. AFIT/GAE/ENY/09-M05. Faculty Advisor: Dr. Mark F. Reeder. Sponsor: AFRL/RB.

DARROW, JOSHUA M., *Thrust Vectoring and Post-Stall Enhancements to the Merlin-Hercules Simulation Program*. AFIT/GSE/ENY/09-M06. Faculty Advisor: Lt Col Frederick G. Harmon. Sponsor: NASIC.

DeLEON, AMANDO, *A Finite Element Evaluation of an Experiment Related to Coating Damping Properties*. AFIT/GA/ENY/09-M03. Faculty Advisor: Dr. Anthony Palazotto. Sponsor: AFRL/RZ.

DOUPE, COLE C., *Finite Element Model Optimization of the FalconSAT-5 Structural Engineering Model*. AFIT/GA/ENY/09-M04. Faculty Advisor: Lt Col Eric D. Swenson. Sponsor: USAFA/DFAS.

FERGUSON, IAIN D.M., *Aerodynamic and Structural Modeling Effects on Subsonic Flutter Prediction for F-16 Store Configuration Clearance*. AFIT/GAE/ENY/09-M08. Faculty Advisor: Dr. Robert A. Canfield. Sponsor: AFSEO.

FRISINGER, PAUL G., *An Experimental Investigation Studying the Influence of Dimples on a Film Cooled Turbine Blade Leading Edge*. AFIT/GAE/ENY/09-M10. Faculty Advisor: Dr. Paul I. King. Sponsor: AFRL/RZ.

GILBERT, JONATHAN, *Direct Initiation of Multiple Tubes by Detonation Branching in a Pulsed Detonation Engine Using Hydrocarbon Fuels*. AFIT/GAE/ENY/09-M09. Faculty Advisor: Dr. Paul I. King. Sponsor: AFRL/RZ.

GREEN, NICHOLAS S., *Structural Optimization of Joined-Wing Beam Model With Bend-Twist Coupling Using Equivalent Static Loads*. AFIT/GAE/ENY/09-J01. Faculty Advisor: Lt Col Eric Swenson. Sponsor: AFRL/RB.

GRUTERS, TYLER F., *Effects of Prior Aging at 288°C in Argon Environment on Creep Response of Carbon Fiber Reinforced PMR-15 Composite With  $\pm 45^\circ$  Fiber Orientation at 288°C*. AFIT/GAE/ENY/09-J02. Faculty Advisor: Dr. Marina Ruggles-Wrenn. Sponsor: AFOSR.

JOHNSON, MICHAEL D., *Dynamic Supersonic Base Store Ejection Simulation Using Beggar*. AFIT/GAE/ENY/08-D01. Faculty Advisor: Dr. Mark F. Reeder. Sponsor: N/A.

JOHNSTON, JEFFREY S., *A Feasibility Study of a Persistent Monitoring System for the Flight Deck of U.S. Navy Aircraft Carriers*. AFIT/GAE/ENY/09-M12. Faculty Advisor: Lt Col Eric D. Swenson. Sponsor: N/A.

KARASZ, WILLIAM J., *Optimal Re-entry Trajectory Terminal State Due to Variations in Waypoint Locations*. AFIT/GA/ENY/08-D01. Faculty Advisor: Dr. Richard Cobb. Sponsor: AFRL/RZ.

KOMIVES, JEFFREY R., *Development of Non-Uniform Radiation Solution Methods for Atmospheric Re-entry Using Detailed Thermal Modeling*. AFIT/GAE/ENY/09-M13. Faculty Advisor: Dr. Robert B. Greendyke. Sponsor: AFOSR.

KUTSAL, TOLGA, *Effect of Steam Environment on Creep Behavior of Nextel720/Alumina-Mullite Ceramic Matrix Composite at Elevated Temperature*. AFIT/GSS/ENY/09-M03. Faculty Advisor: Dr. Marina B. Ruggles-Wrenn. Sponsor: AFRL/RX.

LITTLE, BRYAN, *Application of KAM Theorem to Earth Orbiting Satellites*. AFIT/GA/ENY/09-M05. Faculty Advisor: Dr. William Wiesel. Sponsor: N/A.

MAJOR, MICHAEL P., *Analysis of Dynamic Flight Simulation and the Fidelity of the ATFS-400TM Phoenix Tactical Flight Simulator*. AFIT/GAE/ENY/09-S04. Faculty Advisor: Lt Col Christopher M. Shearer. Sponsor: N/A.

McFARLAND, CHESTER D., *Near Real-Time Closed-Loop Optimal Control Feedback for Spacecraft Attitude Maneuvers*. AFIT/GA/ENY/09-M06. Faculty Advisor: Lt Col Eric D. Swenson. Sponsor: AFRL/RV.

MORGAN, BRYAN K., *Building of a Laser Diagnostic Tool to Measure the Ion Velocity in a Low Power Hall Thruster*. AFIT/GAE/ENY/09-M04. Faculty Advisor: Lt Col Richard Branam. Sponsor: AFRL/RZ.

NYE, ANDREW, *Ceramic Matrix Composite Characterization Under a Combustion and Loading Environment*. AFIT/GMS/ENY/09-M01. Faculty Advisor: Dr. Shankar Mall. Sponsor: N/A.

OLMSTEAD, DELL T., *Cavity Coupled Aeroramp Injector Combustion Study*. AFIT/GAE/ENY/09-J03. Faculty Advisor: Lt Col Richard Branam. Sponsor: AFRL/RZ.

OZER, MUZAFFER, *Effects of Environment on Creep Behavior of Nextel720/Alumina-Mullite Ceramic Composite with  $\pm 45^\circ$  Fiber Orientation at  $1200^\circ\text{C}$* . AFIT/GSS/ENY/09-M05. Faculty Advisor: Dr. Marina B. Ruggles-Wrenn. Sponsor: AFRL/RX.

OZMEN, OZGUR, *Effects of Prior Aging at  $316^\circ\text{C}$  in Argon on Inelastic Deformation Behavior of PMR-15 Polymer at  $316^\circ\text{C}$ : Experiment and Modeling*. AFIT/GSS/ENY/09-M06. Faculty Advisor: Dr. Marina B. Ruggles-Wrenn. Sponsor: AFOSR.

PIERCE, CHRISTIAN J., *Creep and Fatigue Interaction Characteristics of PWA1484*. AFIT/GMS/ENY/09-M02. Faculty Advisor: Dr. Anthony Palazotto. Sponsor: AFRL/RZ.

POHLMAN, MITCHELL R., *Critical Design Parameters for Pylon-Aided Gaseous Fuel Injection Upstream of a Flameholding Cavity*. AFIT/GAE/ENY/09-M15. Faculty Advisor: Dr. Robert B. Greendyke. Sponsor: AFRL/RZ.

RODRIGUEZ, JAVIER, *Fatigue Evaluation of Nanocomposites as Lightweight Electronic Enclosures for Satellites' Applications*. AFIT/GMS/ENY/09-M03. Faculty Advisor: Dr. Shankar Mall. Sponsor: N/A.

ROGERS, MARSHALL M., *An Investigation into the Feasibility of Using a Modern Gravity Gradient Instrument for Passive Aircraft Navigation and Terrain Avoidance*. AFIT/GAE/ENY/09-M16. Faculty Advisor: Maj Richard E. Huffman. Sponsor: AFRL/RV & AFRL/RW.

ROTTER, JOHN E., *An Analysis of Multiple Configurations of Next-Generation Cathodes in a Low Power Hall Thruster*. AFIT/GA/ENY/09-M07. Faculty Advisor: Lt Col Richard Branam. Sponsor: AFRL/RZ.

SEO, MYEONGKYO, *Characterizing the Exhaust Plume of the Three-Electrode Micro Pulsed Plasma Thrusters*. AFIT/GSS/ENY/09-M07. Faculty Advisor: Lt Col Richard Branam. Sponsor: AFRL/RZ.

SERIANNE, CHRISTINA R., *Tunable Diode Laser Absorption Spectroscopy Verification Analysis for Use in the Combustion Optimization and Analysis Laser Laboratory*. AFIT/GAE/ENY/09-M17. Faculty Advisor: Lt Col Richard Branam. Sponsor: AFOSR.

SHEIRICH, PHILIP, *An Engineering Trade Space Analysis for a Space-Based Hyperspectral Chromotomographic Scanner*. AFIT/GA/ENY/09-M08. Faculty Advisor: Dr. Jonathan Black. Sponsor: N/A.

SIMMONS, JOSEPH R., *Aeroelastic Optimization of Sounding Rocket Fins*. AFIT/GSS/ENY/09-J02. Faculty Advisor: Dr. Jonathon Black. Sponsor: AFRL/RB.

SMITH, AUSTIN L., *UAS Collision Avoidance Algorithm that Minimizes the Impact on Route Surveillance*. AFIT/GAE/ENY/09-M18. Faculty Advisor: Lt Col Frederick G. Harmon. Sponsor: AFRL/RZ.

STEVENS, CHRISTOPHER A., *Fuel Composition and Performance Analysis of Endothermically Heated Fuels for Pulse Detonation Engines*. AFIT/GAE/ENY/09-M21. Faculty Advisor: Dr. Paul King. Sponsor: AFRL/RZ.

SULLIVAN, KATHLEEN M., *Numerical Investigation of Geometric Effects on Total Pressure Recovery for Serpentine Ducts*. AFIT/GAE/ENY/09-M14. Faculty Advisor: Dr. Paul King. Sponsor: NASIC.

TRAYLOR II, ALFRED G., *Effects of Contact Load on the Fretting Fatigue Behavior of IN-100 at Elevated Temperature*. AFIT/GMS/ENY/09-M04. Faculty Advisor: Dr. Shankar Mall. Sponsor: N/A.

TURAN, MUSTAFA, *Tools for the Conceptual Design and Engineering Analysis of Micro Air Vehicles*. AFIT/GAE/ENY/09-M19. Faculty Advisor: Lt Col Frederick G. Harmon. Sponsor: AFRL/RB.

WILLIAMS, JACOB J., *An Investigation of Modifications to the Rotary Wing Stores Integration Suite for Improved Accuracy and Efficiency*. AFIT/GAE/ENY/09-S05. Faculty Advisor: Dr. Donald L. Kunz. Sponsor: USARDECOM.

WILLIAMS, MICHAEL D., *Wind Tunnel Analysis and Flight Test of a Wing Fence on a T-38*. AFIT/GAE/ENY/09-M20. Faculty Advisor: Dr. Mark F. Reeder. Sponsor: USAFTPS.

WILLIS, GARRET M., *Empirical Source Model Development for Hall Thruster Plasma Plume Characterization*. AFIT/GA/ENY/09-M09. Faculty Advisor: Lt Col Richard Branam. Sponsor: AFRL/RZ.

WITT, BARRY R., *Mission Planning for Close-Proximity Satellites*. AFIT/GA/ENY/09-M10. Faculty Advisor: Dr. William Wiesel. Sponsor: AFRL/RV.



### 5.1.3. FACULTY RESEARCH OUTPUT

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

#### **BLACK, JONATHAN T.,**

Assistant Professor of Aerospace Engineering, Department of Aeronautics and Astronautics, AFIT  
Appointment Date: 2007 (AFIT/ENY), BS Industrial Engineering, University of Illinois at Urbana-Champaign, 2001; MS Mechanical and Aerospace Engineering, Joint Institute for Advancement of Flight Sciences (joint NASA Langley Research Center and George Washington University program), 2003; PhD Mechanical Engineering, University of Kentucky, 2006. His research interests include structural and nonlinear dynamics, noncontact measurement systems, and computational structural mechanics. Tel. 255-3636 x4578, email: [Jonathan.Black@afit.edu](mailto:Jonathan.Black@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

"Experimental Fin Tips for Reusable Launch Vehicles (ExFiT)." Sponsor: AFRL/RB. Funding: \$15,000.

"Hybrid Laser/Video 3D Non-Contact Motion Capture and Analysis." Sponsor: AFOSR. Funding: \$120,000.

#### REFEREED JOURNAL PUBLICATIONS

Black, J.T., Leifer, J., and S.W. Smith, "Global Static Testing and Model Validation of Stiffened Thin Film Polyimide Panels," *Journal of Spacecraft and Rockets*, Vol. 45, No. 6, 11/2008 – 12/2008, pp. 1319-1324.

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

McFarland, D., Swenson, E., Black, J., Cobb, R., and Fosbury, A., "Near Real-Time Closed-Loop Optimal Control Feedback for Spacecraft Attitude Maneuvers," *AIAA Modeling and Simulation Technologies Conference*, Chicago, IL, 08/2009, AIAA Paper 2009-5814.

Doupe, C.C., Swenson, E.D., George, L.E., and Black, J.T., "Finite Element Model Tuning with Varying Experimental Data Density," *AIAA Modeling and Simulation Technologies Conference*, Chicago, IL, 08/2009, AIAA Paper 2009-6038.

Cooper, B., Cobb, R., and J. Black, "Rigidizable Inflatable Get-Away-Special Experiment Post Flight Analysis," *50th AIAA/ASME/ASCE/AHS/ASC Conference on Structures, Structural Dynamics and Materials*, Palm Springs, CA, 05/2009, AIAA Paper 2009-2157.

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Owens, J., Cobb, R., and Black, J., "Design and Flight Qualification of the Rigidizable Inflatable Get Away Special Experiment" *50th AIAA/ASME/ASCE/AHS/ASC Conference on Structures, Structural Dynamics and Materials*, Palm Springs, CA, 05/2009, AIAA Paper 2009-2155.

Pitcher, N.A., Black, J.T., Reeder, M.F., and R.C. Maple, "Videogrammetry Measurements of a Mini-UAV Wing in a Wind Tunnel," *50th AIAA/ASME/ASCE/AHS/ASC Conference on Structures, Structural Dynamics and Materials*, Palm Springs, CA, 05/2009, AIAA Paper 2009-2416.

Simpkins, J., Sollars, R., Allen, C., Jennings, A., and J.T. Black, "Dynamic Calibration and Performance of a Laser Steering System for Dynamic In-Flight Tracking and Measurement," *50th AIAA/ASME/ASCE/AHS/ASC Conference on Structures, Structural Dynamics and Materials*, Palm Springs, CA, 05/2009, AIAA Paper 2009-2159.

Quarles, W., Blandino, J., and J. Black, "Development of a Laser Positioning System for On- Orbit Characterization of Deployable Booms," *50th AIAA/ASME/ASCE/AHS/ASC Conference on Structures, Structural Dynamics and Materials*, Palm Springs, CA, 05/2009, AIAA Paper 2009-2176.

Simpkins, J., Sollars, R., Jennings, A., Allen, C., and J. Black, "Calibration and Performance of Laser Steering System for Dynamic In-Flight Tracking and Measurement," *SPIE Smart Structures, Materials, and Non-Destructive Evaluation Conference*, San Diego, CA, 03/2009, SPIE Paper 7292-131.

Simmons, J., Deleon, A., Black, J., and E. Swenson, "Aeroelastic Analysis and Optimization of FalconLaunch Sounding Rocket Fin," *47th AIAA Aerospace Sciences Meeting*, Orlando, FL, 01/2009, AIAA Paper 2009-515.

**BRANAM, RICHARD D., Lt Col,**

Assistant Professor of Aeronautical Engineering, Department of Aeronautics and Astronautics, AFIT  
Appointment Date: 2005 (AFIT/ENY); BS, Aerospace Engineering, The Ohio State University, 1993; MS, Aeronautical Engineering, Air Force Institute of Technology, 1997; PhD, Aerospace Engineering, The Pennsylvania State University, 2005. Major Branam's primary research areas of interest are rocket propulsion and hypersonics. Previous assignments include research scientist at the German Aerospace Center in the area of supersonic injection and as program manager of the upper stage rocket demonstration at the Air Force Research Laboratory. Tel. 937-255-3636 x7485 (DSN 785-3636 x7485), email: [Richard.Branam@afit.edu](mailto:Richard.Branam@afit.edu)

SPONSOR FUNDED RESEARCH PROJECTS

"AFIT Space and Rocket Propulsion Research." Sponsor: AFRL/RZ. Funding: \$75,000.

"Ultra Compact Combustor Cavity Vane Interactions." Sponsor: AFOSR. Funding: \$43,130.

REFEREED JOURNAL PUBLICATIONS

Branam, R. and M. Micci, "Comparison of Wall Models for the Molecular Dynamics Simulation of Microflows," *Nanoscale and Microscale Thermophysical Engineering*, Vol. 13 Issue 1, January 2009, pp. 1-12.

Kostka Jr., S., Roy, S., Lakusta, P., Meyer, T., Renfro, M., Gord, J. and Branam, R., "Comparison of line-center and line-scanning excitation in two-color laser-induced-fluorescence thermometry of OH," *Applied Optics*, Vol. 48, No. 35, 10 December 2009.

Jantz, B., R. Branam and L. Brieda, "TacSat-2 Surface Erosion and Contamination by a 200 W Hall Effect Thruster," *JANNAF Journal*.

Warner, D., R. Branam and W. Hargus, "Ignition & Plume Characteristics of Low-Current Cerium and Lanthanum Hexaboride Hollow Cathodes," *Journal of Propulsion and Power*.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

McCall, J. and Branam, R., "Effect of Radial Curvature in Rockets on Film Cooling Adiabatic Effectiveness and Jet Width," *Proceedings of ASME 2008 International Mechanical Engineering Congress and Exposition*, October 31-November 6, 2008, Boston, USA.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Farnell, C.C., Brown, D.L. Garret, M.W., Branam, R.D. and Williams, J.D., "Remote Diagnostic Measurements of Hall Thruster Plumes," *The 31<sup>st</sup> International Electric Propulsion Conference*, University of Michigan, 20 - 24 September, 2009.

Kostka Jr., S., Renfro, M., Lakusta, P., Branam, R., Roy, S., Gord, J., Meyer, T., "Comparison of line center and line-scanning excitations in two color laser induced fluorescence thermometry of OH," Paper 31A3, Proceedings of the 2009 Joint U.S. Section Meeting, The Combustion Institute, Ann Arbor, MI, May 2009.

McCall, J. and Branam, R., "Effects of Radial Curvature on Net Heat Flux Reduction in a Film-Cooled Rocket," AIAA Aerospace Sciences Conference, Orlando, FL, 5-9 January 2009.

McCall, J. and Branam, R., "Transpiration Cooling Models Applied to Perforated Plates in a Converging Rocket Nozzle," 6th MSS/4th LPS/3rd SPS JANNAF Joint Subcommittee Meeting, Orlando, FL, 8-12 December 2008.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Dayton-Cincinnati Aerospace Sciences Symposium Corporate Exhibit Chair.

Promoted to Associate Fellow in AIAA.

#### **COBB, RICHARD G.,**

Assistant Professor of Aerospace Engineering, Department of Aeronautics and Astronautics, AFIT  
Appointment Date: 2001 (AFIT/ENY); BS, the Pennsylvania State University, 1988; MS, Air Force Institute of Technology, 1992; PhD, Air Force Institute of Technology, 1996. Research interests include dynamics and control of flexible space structures for remote sensing applications, system identification techniques, control of micro air vehicles, and applications of optimal control theory. Prior to teaching at AFIT, Dr. Cobb was responsible for the establishment of an Air Force wide Reliability Centered Maintenance program to enhance jet engine reliability. In recognition of his accomplishments, Dr. Cobb was selected as the 2001 Senior Military Engineer of the Year for the Aeronautical Systems Center. Prior to his assignment at WPAFB in September 1999, Dr. Cobb served as program manager for the Air Force Research Laboratory's TechSat 21 program, a revolutionary satellite technology program investigating the feasibility of using distributed micro-satellite constellations to satisfy Air Force global sensing requirements. While at Kirtland AFB NM, Dr. Cobb also served as the technical advisor for the Space Vehicles Technology Branch, and Chief of the Dynamic Systems Group. Dr Cobb is an Associate Fellow of AIAA. Tel. 937-255-3636 x4559 (DSN 785-3636 x4559), email: [Richard.Cobb@afit.edu](mailto:Richard.Cobb@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

"Attitude Path Planning for Responsive Spacecraft." Sponsor: AFRL/RV. Funding: \$35,000.

"Dynamic Organization for Rapid Route Planning and Analysis." Sponsor: USSTRATCOM. Funding: \$30,000.

"Lucky Imaging of Low Earth Orbiting Satellites." Sponsor: SAF. Funding: \$30,000.

"Planning, Guidance and Control for Multiple UAV Cooperative Operations." Sponsor: AFRL/RB. Funding: \$20,000. [ANT]

"Pseudospectral Optimization for Conventional Prompt Global Strike." Sponsor: AFRL/RZ. Funding: \$75,000.

"Space Situational Awareness Studies." Sponsor: SAF. Funding: \$132,555.

#### REFEREED JOURNAL PUBLICATIONS

Irvin, D. R., Cobb, R.G., and Lovell, T. A., "Fuel-Optimal Maneuvers for Constrained Relative Satellite Orbits," *AIAA Journal of Guidance, Control and Dynamics*, Vol 32, No 3, pp. 960-973, May-June 2009.

Holstein, R. G., Palazotto, A. N., Cobb, R.G., "Structural Design Considerations of an Inflatable Rigidizable Space Shuttle Experiment," *Journal of Aerospace Engineering*, Vol 22, No 2, pp. 123-133 April 2009.

Jorris, T. R. and Cobb, R. G. "3-D Trajectory Optimization Satisfying Waypoints and No-Fly Zone Constraints," *AIAA Journal of Guidance, Control and Dynamics*, Vol 32, No 2, pp. 551-572, March-April 2009.

Shepherd, M. J., Cobb, R. G., Palazotto, A. N. , and Baker, W. P., "Modal Transformation Method for Deformable Membrane Mirrors," *AIAA Journal of Guidance, Control and Dynamics*, Vol 32, No 1, pp. 276-289, January-February 2009.

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

McFarland, C., Swenson, E., Black, J. and Cobb, R, "Near Real-Time Closed-Loop Optimal Feedback Control for Spacecraft Attitude Maneuvers," AIAA Guidance, Navigation, and Control Conference and Exhibit, 10–13 August 2009, Chicago, IL, AIAA-2009-5814.

Cooper, B., Black, J. and Cobb, R, "Rigidizable Inflatable Get-Away-Special Experiment Post Flight Analysis," 50th AIAA/ASME/ASCE/AHS/ASC Conference on Structures, Structural Dynamics and Materials, Palm Springs, CA, May 2009, AIAA Paper 2009-2157.

Owens, J., Cobb, R., and J. Black, "Design and Flight Qualification of the Rigidizable Inflatable Get- Away Special Experiment" 50th AIAA/ASME/ASCE/AHS/ASC Conference on Structures, Structural Dynamics and Materials, Palm Springs, CA, May 2009, AIAA Paper 2009-2155.

Browning, J., Cobb, R.G., and Canfield, R.A., "F- 16 Ventral Fin Buffet Alleviation Using Piezoelectric Actuators" 50th AIAA/ASME/ASCE/AHS/ASC Conference on Structures, Structural Dynamics and Materials, Palm Springs, CA, May 2009, AIAA Paper 2009-2538.

Shepherd, M. J., MacDonald, A., Gray, W.R. and Cobb, R. G., "Limited Simulator Aircraft Handling Qualities Evaluation of an Adaptive Controller." IEEE Aerospace Conference, Paper #1292, Big Sky MT, Mar 2009.

Irvin, D. R., Cobb, R.G., and Lovell, T. A., "An Investigation of Teardrop Relative Orbits For Circular and Elliptical Chief Satellites" 19th AAS/AIAA Astrodynamics Specialist Conference, Savannah, GA February 8-12, 2009, AAS 09-110.

Curtis, D., Reeder, M., Svanberg, C., and Cobb, R., "Flapping Wing Micro Air Vehicle Bench Test Set-up," 47th AIAA Aerospace Sciences Meeting, Orlando, FL, 5-8 January 2009, AIAA Paper 2009-1272.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Technical Paper Referee: *AIAA Journal* and *AIAA Journal of Spacecraft and Rockets*.

#### **DECKER, DOUGLAS D.,**

Assistant Professor of Aerospace Engineering, Department of Aeronautics and Astronautics, AFIT  
Appointment Date: 2008 (AFIT/ENY); BS, University of Kansas, 1987; MS, Air Force Institute of Technology, 1994; PhD, Air Force Institute of Technology, 2004. Research interests include nonlinear control, optimal control, optimization, applications of nonlinear/optimal control, astrodynamics, satellite attitude control, control of unmanned air vehicles, search theory. Previous assignments include serving as a SCRAMJET Controls Engineer, GPS Satellite Engineering Officer and Systems Analyst, and Satellite Vehicle Crew Evaluator. He is a member of Sigma Gamma Tau, Tau Beta Pi, and is a Senior Member of AIAA. Tel. 937-255-3636 x7465 (DSN 785-3636 x7465), email: [Douglas.Decker@afit.edu](mailto:Douglas.Decker@afit.edu)

**FRANKE, MILTON E.,**

Professor Emeritus of Aerospace Engineering, Department of Aeronautics and Astronautics, AFIT  
Appointment Date: 1959 (AFIT/ENY); BME, University of Florida, 1952; MSME, University of Minnesota, 1954; PhD, The Ohio State University, 1967. Research interests include fluid transmission lines, thrust vector control, high lift aerodynamics, fluidics, cavity acoustics, thrust augmenting ejectors, heat transfer, electrostatic cooling, boundary layers, aerodynamic in-ground effects, lean aerospace initiatives, reusable launch vehicles, and engineering of complex systems. Dr. Franke has authored or co-authored over 130 technical articles. He holds five patents, was the recipient of the AFIT Charles A. Stone Award in 1986 and the AFIT Bernard A. Schriever Award in 1993. Dr. Franke is a retired colonel in the Air Force Reserve. He is chair of the Committee on Organization and Rules (a committee of the ASME Board of Governors), past Vice President for Communications of the ASME (1990-1992), past Vice President for Systems and Design of the ASME (1993-1996), co-chair of the AIAA Weapon System Effectiveness Technical Committee, a Fellow of the ASME, and Associate Fellow of the AIAA. Dr. Franke retired 31 March 2007. Tel. 937-255-3636, x 4720 (DSN 785-3636, x 4720), email: [Milton.Franke@afit.edu](mailto:Milton.Franke@afit.edu)

**GREENDYKE, ROBERT B.,**

Associate Professor of Aeronautics and Astronautics and Director, AFIT Scientist and Engineer Education Programs at Kirtland AFB; 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. Dr Greendyke was a Research Scientist at NASA-Langley Research Center studying re-entry and aerobraking flows, and an Associate Professor in the University of Texas at Tyler establishing a start-up Mechanical Engineering Program from concept through accreditation. He has published over 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](mailto:Robert.Greendyke@afit.edu)

**SPONSOR FUNDED RESEARCH PROJECTS**

"Computational Simulation of Experimental Ablative Flowfields." Sponsor: AFOSR. Funding: \$23,120.

"Development of Coupled Flowfield- Radiation Solution Methods in Ablative Environments." Sponsor: AFOSR. Funding: \$31,903.

"Effects of Local Entropy Gradients on the Translational Nonequilibrium in a Shock Wave Structure." Sponsor: AFRL/RB. Funding: \$2,950.

"Reusable Launch Vehicle Flight Aerodynamics with High-Fidelity Hypersonic Flowfield Solvers." Sponsor: AFRL/RB. Funding: \$40,000.

**REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW**

Camberos, J.A., Greendyke, R.B., Lambe, L.A., "Computational Experiments With Direct Simulation Quasi-Random Monte Carlo," AIAA Paper 2009-3742, San Antonio, TX, June 2009.

Bagg, M.G., Greendyke, R.B., "Computational Analysis of Strut Induced Mixing in a Scram-Jet," AIAA Paper 2009-1253, Orlando, FL, January 2009.

Pohlman, M.R., Greendyke, R.B., "Critical Design Parameters for Pylon-Aided Gaseous Fuel Injection," AIAA Paper 2009-1422, Orlando, FL, January 2009.

Komives, J.R., Greendyke, R.B., "Development of Coupled Flowfield-Radiation Solution Methods in Ablative Environments," AIAA 2009-1031, Orlando FL, January 2009.

Bentley, B.I., Greendyke, R.B., "Using the Unified Flow Solver to Investigate the Normal Shock Wave Structure," AIAA Paper 2009-1541, Orlando, FL, January 2009.

**HARMON, FREDERICK G., Lt Col,**

Assistant Professor of Aeronautical Engineering, BS, Electrical Engineering, Embry-Riddle Aeronautical University, 1992; MS, Electrical Engineering, Air Force Institute of Technology, 1996; PhD, Mechanical Engineering, University of California-Davis, 2005. Lt Col Harmon's research interests include the cooperative control of multiple unmanned aerial vehicles, autonomous vehicle guidance and control, bio-inspired control and technologies, adaptive and reconfigurable flight control, nonlinear control, robotics, alternative energy systems, and fuel cell technology. His previous assignments were in research labs, intelligence organizations, and flight test squadrons. He has published several conference papers and journal articles as well as DoD publications. He is a member AIAA, IEEE, and AUVSI. Tel. 937-255-3636, x7478 (DSN 785-3636, x7478), e-mail: [Frederick.Harmon@afit.edu](mailto:Frederick.Harmon@afit.edu)

**SPONSOR FUNDED RESEARCH PROJECTS**

"Design of a Parallel Hybrid-Electric Propulsion System for a Small Unmanned Aircraft System." Sponsor: AFRL/RZ. Funding: \$10,000.

**HARTSFIELD, CARL R., Lt Col,**

Assistant Professor of Aeronautical Engineering, Department of Aeronautics and Astronautics, AFIT Appointment Date: 2009 (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. Lt Col Hartsfield's primary research areas of interest are rocket propulsion and exhaust plume signature mechanisms. Previous assignments include managing development and integration of adjunct payloads at the National Reconnaissance Office and investigation of mission utility and support requirements for directed energy weapons on tactical aircraft. Tel. 937-255-3636 x7472 (DSN 785-3636 x7472), email: [Carl.Hartsfield@afit.edu](mailto:Carl.Hartsfield@afit.edu)

**HICKS, KERRY D., Lt Col,**

Assistant Professor of Aerospace Engineering, Department of Aeronautics and Astronautics, AFIT Appointment Date: 2004 (AFIT/ENY), BS Aeronautical and Astronautical Engineering, University of Illinois (UIUC), 1985; MS Astronautical Engineering, Air Force Institute of Technology, 1986; PhD Astronautical Engineering, Air Force Institute of Technology, 1989. Lt Col Hicks' research interests include astrodynamics, re-entry dynamics, and electric space propulsion with emphasis on numerical solutions and mathematical modeling. He has published several conference papers and journal articles as well as DoD publications. He is a member of Tau Beta Pi and a Senior Member of AIAA. Tel. 937-255-3636 x4568 (DSN 785-3636 x4568), email: [Kerry.Hicks@afit.edu](mailto:Kerry.Hicks@afit.edu)

**HUFFMAN Jr., RICHARD E., Lt Col,**

Assistant Professor of Aerospace Engineering, Department of Aeronautics and Astronautics, AFIT Appointment Date: 2007 (AFIT/ENY); BS Aeronautical and Astronautical Engineering, Purdue University, 1994; MS Aeronautical Engineering, Air Force Institute of Technology 1995; PhD Aerospace Engineering, University of Illinois at Urbana-Champaign, 2007. Lt Col Huffman's research interests include weapon design, combat survivability enhancement, plasma dynamics, non-intrusive fluid diagnostics and covert navigation systems. His current work involves using the earth's gravity field for unique navigation techniques and the creation of non-intrusive diagnostics to measure plasma propulsion and control devices. Lt Col Huffman's prior assignments include airframe and avionics flight test on the F-22, instructor at the USAF Test Pilot School, avionics integration flight testing in the Air Force Research Laboratory's Air Vehicles Directorate and combat simulation with the National Air and Space Intelligence Center. Tel. 255-6565 x7490, email: [Richard.Huffman@afit.edu](mailto:Richard.Huffman@afit.edu)



#### SPONSOR FUNDED RESEARCH PROJECTS

"Aircraft Survivability." Sponsor: USSTRATCOM. Funding: \$15,000.

"Negative Ps Test Planning Tool Development." Sponsor: AFMC. Funding: \$10,000.

#### **KING, PAUL I.,**

Professor of Aerospace Engineering, Department of Aeronautics and Astronautics, AFIT Appointment Date: 1991 (AFIT/ENY); BS, Arizona State University, 1971; MS, Air Force Institute of Technology, 1972; PhD, Oxford University, England, 1986. He is a former faculty member at the U.S. Air Force Academy and at the Cleveland State University. Dr. King's research interests include internal and external aerodynamics and heat transfer (wings and bodies, turbomachinery and other applications). His research emphasizes experimentation and instrumentation. He has published over 100 articles and reports and chaired over 70 theses and dissertations. Tel. 937-255-3636 x4628 (DSN 785-3636 x4628), email: [Paul.King@afit.edu](mailto:Paul.King@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

"CFD Modeling of Pressure Recovery in S-Bend Engine Inlet Ducts." Sponsor: NASIC. Funding: \$4,000.

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Rutledge, J.L., King, P.I. and Rivir, R., "CFD Predictions of Pulsed Film Cooling Heat Flux on a Turbine Blade Leading Edge," Paper IMECE2008-67276, Proceedings of ASME Intl Mech Engr Congress and Exposition, Nov 26, 2008, Boston, MA. Won best paper of Session.

#### **KUNZ, DONALD L.,**

Associate 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, multibody dynamics, smart structures, and computational structural mechanics. He has published more than 60 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 ASME; and a licensed professional engineer in the Commonwealth of Virginia. Tel. 937-255-3636 x4548 (DSN 785-3636 x4548), email: [Donald.Kunz@afit.edu](mailto:Donald.Kunz@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

"Validation and Verification of Stores Separation Software." Sponsor: Army AMRDEC. Funding: \$25,000.

#### REFEREED JOURNAL PUBLICATIONS

Kunz, D.L. and Newkirk, M.C., "A Generalized Dynamic Balancing Procedure for the AH-64 Tail Rotor," Journal of Sound and Vibration, Vol. 326, Nos. 1-2, September 2009, pp. 353-366.

Kunz, D.L., "Numerical Investigation of Constrained Direct Solutions Using Hamilton's Law," AIAA Journal, Vol. 47, No. 11, November 2009, pp.2747-2756.

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Kunz, D.L., "Numerical Investigation of Constrained Direct Solutions Using Hamilton's Law," 50th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, Palm Springs, California, May 2009.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Subject Matter Expert on the Technology Readiness Assessment Independent Review Panel for CSAR-X.

#### **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 eigenstructure assignment and control, stability and control of aerospace vehicles, passive and active control of large flexible structures, and aircraft handling qualities. He has published over 30 articles and reports and chaired over 40 theses and dissertations. Prior to teaching at AFIT, Professor Liebst was Assistant Professor of Aerospace Engineering for 6 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 (DSN 785-6565 x4636), email: [Bradley.Liebst@afit.edu](mailto:Bradley.Liebst@afit.edu)

#### **LOFTHOUSE, ANDREW J., Maj,**

Assistant Professor of Aeronautical Engineering, Department of Aeronautics and Astronautics, AFIT  
Appointment Date: 2008 (AFIT/ENY); BS Mechanical Engineering, Brigham Young University, 1997; MS Aeronautical Engineering, Air Force Institute of Technology, 2002; PhD Aerospace Engineering, University of Michigan, 2008. Maj Lofthouse's research interests include all aspects of computational fluid dynamics, both continuum-based and kinetic methods, with specific interest in hypersonic reacting flows and nonequilibrium gas dynamics. Additional interests include automatic mesh refinement (AMR) using cartesian grids, and Python scripting for computational science. He has published several conference papers and journal articles. He is a member of Tau Beta Pi and a Senior Member of AIAA. Tel. 937-255-3636 x4537 (DSN 785-3636 x4537), email: [Andrew.Lofthouse@afit.edu](mailto:Andrew.Lofthouse@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

"Nonequilibrium Gas Flows Using the Unified Flow Solver." Sponsor: AFOSR. Funding: \$16,310.

"Repeatability of Store Separation Through Unsteady Flow." Sponsor: AFSEO. Funding: \$9,130.

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Lofthouse, A. J., "Hypersonic Blunt Body Thermophysics Using a Unified Kinetic/Continuum Solver," 41<sup>st</sup> AIAA Thermophysics Conference, San Antonio, TX, June 2009.

Lofthouse, A. J. and Boyd, I. D., "Nonequilibrium Aerothermodynamics of Sharp-Leading Edges," 47<sup>th</sup> AIAA Aerospace Sciences Meeting including the New Horizons Forum and Aerospace Exposition, Orlando, FL, January 2009.

Lofthouse, A. J. and Boyd, I. D., "Hypersonic Flow Over a Flat Plate: CFD Comparison with Experiment," 47<sup>th</sup> AIAA Aerospace Sciences Meeting including the New Horizons Forum and Aerospace Exposition, Orlando, FL, January 2009.



**MALL, SHANKAR,**

Distinguished Professor, Department of Aeronautics and Astronautics, AFIT Appointment Date: 1986 (AFIT/ENY); BS, Mechanical Engineering, Banaras Hindu University, India, 1964; MS, Mechanical Engineering, Banaras Hindu University, 1966; PhD, Mechanical Engineering, University of Washington, 1977. Dr. Mall's research centers on composite and smart materials, fatigue and fracture. Dr. Mall has authored over 300 papers and has been the co-editor of a book and five conference proceedings. He is a Fellow of ASME, Associate Fellow of AIAA. He was also the Principal Materials Research Engineer, Materials and Manufacturing Directorate, Air Force Research Laboratory. Tel. 937-255-3636 x4587 (DSN 785-3636 x4587), email: [Shankar.Mall@afit.edu](mailto:Shankar.Mall@afit.edu)

**SPONSOR FUNDED RESEARCH PROJECTS**

"Analysis of Shape Memory Polymer Hybrid Composites." Sponsor: AFRL/RB. Funding: \$12,500.

"Nanocomposites as Lightweight Electronics Enclosures for Satellites' Applications." Sponsor: AS&T. Funding: \$88,385.

**REFEREED JOURNAL PUBLICATIONS**

Sabelkin, V. and Mall, S., "Adhesion Force during Microcontact Interaction between Cylindrical-Segment-on-Flat and Flat Bodies," International Journal of Mechanics and Materials in Design, Vol. 4, 333-357, 2008.

Mall, S. and Ryba, J. L., "Effects of Moisture on Tensile Stress Rupture Behavior of a SiC/SiC Composite at Elevated Temperatures," Composites Science and Technology, Vol. 68, 274-282, 2008.

Yang, B. and Mall, S., "Mechanics of Two-Stage Crack Growth in Fretting Fatigue" Engineering Fracture Mechanics, Vol. 75, 1507-1515, 2008.

Fadaq, H. A., Mall, S. and Jain V. K. "A Finite Element Analysis of Fretting Fatigue Crack Growth Behavior in Ti-6Al-4V," Wear, Vol. 264, 1384-1399, 2008.

Mall, S., Ng, J. L. and Madhi, E., "Fretting Fatigue Behavior of Shot-Peened Ti-6Al-4V and IN100," Journal of ASTM International, Vol. 5, 2008.

Magaziner, R. S., Jain V. K. and Mall, S., "Wear Characterization of Ti-6Al-4V under Fretting-Reciprocating Sliding Conditions," Wear, Vol. 264, 1002-1014, 2008.

Mall, S., Ahn, J-M., "Effects of Cyclic Frequency on the Fatigue Behavior of an Oxide/oxide Composite," Ceramic Transactions, Vol. 178, pp. 111-116, 2008.

Mall, S., Ahn, J-M., "Frequency Effects on Fatigue Behavior of Nextel 720TM/Alumina at Room Temperature," Journal of European Ceramic Society, Vol. 28, pp. 2783-2789, 2008.

Mall, S., Naboulsi, S. and Namjoshi, S. A., "Contact Geometry Effects on Fretting Fatigue Crack Initiation Behavior of Ti-6Al-4V," Tribology - Materials, Surfaces & Interfaces, Vol. 2, 25-32, 2008.

**REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW**

Gilbert, K. W., Mall, S., Leedy, K. D. and Crawford, B., "A Nanoindenter Based Method for Studying MEMS Contact Switch Microcontacts," Proceedings of the 2008 IEEE Holm Conference on Electrical Contacts, Orlando, FL, 27-29 October, 2008.

Mall, S., Harder, B. T., Petrosky, J. C., Hansen, M. D. and Hansen, N.D., "Investigation in Nickel Nanostrands Based Nanocomposite for Space Applications," Proceeding of Hardened Electronic and Radiation Technology, 2009.

McGary, J., Petrosky, J. C., Mall, S., Farlow, G. and Hansen, N.D., "Measured Electrostatic Discharge Parameters For Nickel Nanostrands Based Nanocomposites for Space Applications, Proceeding of Hardened Electronic and Radiation Technology, 2009.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Invited Talk: "Fatigue Behavior of Ceramic Matrix Composites in Gas Turbine Engine Environment," International Conference on High Temperature Ceramic Matrix Composites, 23-25 Feb. 2009, Varanasi, India.

#### BOOKS AND CHAPTERS IN BOOKS

Mall, S., "Influence of Resin on Delamination," Chapter 25, Delamination Behaviour of Composites, Woodhead Publishing, 721-740, 2008 (invited).

#### **PALAZOTTO, ANTHONY N.,**

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. Professor 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 over 201 archival technical publications and more than 460 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 and a Fellow of the American Academy of Mechanics. He is a registered Professional Engineer in the state of Ohio. Tel. 937-255-3636 x4599 (DSN 785-3636 x4599), email: [Anthony.Palazotto@afit.edu](mailto:Anthony.Palazotto@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

"Development of a New Technique for Determining the Strain Dependent Damping and Stiffness Characteristics of Hard Coatings." Sponsor: AFRL/RZ. Funding: \$26,000.

"Evaluation of Nonlinear Movement in Micro Air Vehicles." Sponsor: AFRL/RB. Funding: \$20,617.

"Hypervelocity Impact Gouge Mitigation and Wear Prediction." Sponsor: AFOSR. Funding: \$100,000.

"Structural Evaluation of Slotted Wave Guides." Sponsor: AFRL/RB. Funding: \$25,000.

#### REFEREED JOURNAL PUBLICATIONS

Andrews, J., Palazotto, A. Desimio, M., and Olson, "Lamb Wave Propagation in Varying Isothermal Environment," J. Structural Health Monitoring, Vol. 7, pp. 265-270, 2008.

Reed, S., Palazotto, A., and Baker, W., "An Experimental Technique for the Evaluation of Strain Dependent Materials Properties of Hard Coatings," J. Shock and Vibration, Vol. 15, pp. 697-712, 2008.

Shepherd, M., Cobb, R., Palazotto, A., and Baker, W., "Modal Transformation Method for Deformable Membrane Mirrors," J. Guidance, Control and Dynamics, AIAA journal, Vol. 32, No. 1, pp. 276-289, 2009.

Cinnamon, J. and Palazotto, A., "Analysis and Simulation of Hypervelocity Gouging Impacts for a High Speed Sled Test," J. of Impact Engineering, Vol. 36, pp. 254-262, 2009.

Pollak, K. and Palazotto, A., "A Comparison of Maximum Likelihood Models for Fatigue Strength Characterization in Materials Exhibiting a Fatigue Limit," J. Probabilistic Engineering Mechanics, Vol. 24, pp. 236-241, 2009.

Larson, R., Palazotto, A., and Gardenier, H., "Impact Response of Titanium and Titanium Boride Monolithic and Functionally Graded Composite Plates," AIAA Journal, Vol. 47, No. 3, pp. 675-691, 2009.

Han, S., Palazotto, A., and Leikeas, C., "Finite Element Analysis of Lamb Wave Propagation in a Thin Aluminum Plate," J. Aerospace Engineering, ASCE, pp. 185- 197, April, 2009.

Holstein, R., Palazotto, A., and Cobb, R., "Structural Design Considerations of an Inflatable Rigidizable Space Shuttle Experiment," J. Aerospace Engineering, ASCE, pp. 123-133, 2009.

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Pai, F. and Palazotto, A., "Nonlinear Vibration Characterization of MAV Flapping Wings," presented at the 50<sup>th</sup> AIAA SDM Conference, Palm Springs, CA. March 4-7, 2009, paper AIAA 2009- 2415.

Pai, F., and Palazotto, A., "Online Frequency and Amplitude Tracking of Nonlinear Non-Stationary Structural Vibration," presented at the 50<sup>th</sup> AIAA SDM Conference, Palm Springs, CA. March 4-7, 2009, paper AIAA 2009-2526.

Hale, C., and Palazotto, A., and Baker, W., "Consideration of wear at High Velocities" presented at the 50<sup>th</sup> AIAA SDM Conference, Palm Springs, CA. March 4-7, 2009, paper AIAA 2009-2624.

Voyiadjis, G., Delektas, B., Lodygowski, A., Palazotto, A., and Phillipon, S., "High Rate and Frictional Effects in Wear of Metals Using Strain Gradient Plasticity," presented at the Workshop on Dynamic Behavior of Materials, Metz, France May 12, 2009.

Gardeneir, H., Palazotto, A., Larson, R., "An Experimental Technique for Developing Intermediate Strain Rates on Ductile Metals," presented at the 2009 Joint ASCE-ASME-SES Conference on Mechanics, Blacksburg, VA., June, 24-27, 2009.

Palazotto, A., Deleon, A., and Pearson, L., "Vibration Analysis of Commercial Thermal Barrier Coatings," presented at the 2009 Joint ASCE-ASME-SES Conference on Mechanics, Blacksburg, VA., June, 24-27, 2009.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Associate editor of AIAA Journal.

Editorial Board Journal of Composite Structures.

**POLANKA, MARC D.,**

Associate Professor of Aerospace Engineering, 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 Turbine Engine Division of the Air Force Research Laboratory's Propulsion Directorate. Dr. Polanka's research interests include aspects of heat transfer and fluid mechanics focusing on experimental applications involving turbine and combustor aerodynamics, heat loads, and cooling techniques. Recent publications have focused on low pressure turbine aerodynamics including separation and separation control as well as a variety of combustor – turbine interaction issues. These include a process known as "burning in the turbine" where the film cooling holes can serve as flame holders for unburnt fuels as well as solving issues regarding moving flow out of an Ultra Compact Combustor through the turbine vane in a manner to provide an expected pattern factor to the turbine rotor. Dr. Polanka has also recently become involved in small turbine issues including the use of alternative fuels for the UAV fleet. He has been published in a variety of journals including the Journal of Turbomachinery, the AIAA Journal of Propulsion and Power, and the Journal of Engineering for Gas Turbines and Power. He also has two patents to his credit. Dr. Polanka is an Associate Fellow of the AIAA, the current Section Chair of the Dayton-Cincinnati Section of the AIAA, and the Honors and Awards Chair for the same section. He is also a member of ASME and specifically the K-14 Committee of the International Gas Turbine Institute where is also a Vanguard Chair and the past Point Contact for the annual conference. Tel. 937-255-3636 x4714 (DSN 785-3636 x4714), email: [Marc.Polanka@afit.edu](mailto:Marc.Polanka@afit.edu)

**REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW**

Evans, D., King, P., Polanka, M., Zelina, J., Anderson, W., and Stouffer, S.D., "Impact of Heat Release in Turbine Film Cooling," AIAA 2009-0298, 46th AIAA Aerospace Sciences Meeting and Exhibit, Orlando, FL, Jan 4-8, 2009.

Lin, C., Holder, R., Thornburg, H., Sekar, B., Zelina, J., and Anderson, W., Polanka, M.D., Stouffer, S.D., and Briones, A.M., "Large-Eddy Simulation of Film Cooling in Reactive Flow over a Surface with Shaped Coolant Hole," AIAA 2009-0678, 46th AIAA Aerospace Sciences Meeting and Exhibit, Orlando, FL, Jan 4-8, 2009.

Thornburg, H., Sekar, B., Zelina, J., Anderson W., Polanka, M.D., Lin, C.X., Holder R.J., Briones, A.M., and Stouffer, S.D., "Design Studies of Turbine Blade Film Cooling with Unburned Fuel in Cross Stream Flow" AIAA-2009-0510, 46th AIAA Aerospace Sciences Meeting and Exhibit, Orlando, FL, Jan 4-8, 2009.

**REEDER, MARK F.,**

Associate Professor of Aerospace Engineering, AFIT Appointment Date: 2002 (AFIT/ENY); BS, Mechanical Engineering, West Virginia University, 1989; MS, Mechanical Engineering, Ohio State University, 1991; PhD, Mechanical Engineering, 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. Dr. Reeder's research interests include all aspects of fluid mechanics with an emphasis on experimental applications involving external aerodynamics, mixing enhancement and propulsion. Recent publications include a characterization of store separation from a cavity using pressure sensitive paint and measurements of a micro air vehicle using a 6-DOF balance. He has been published in a variety of journals including the Journal of Fluid Mechanics, The AIAA Journal, The AIAA Journal of Propulsion and Power, Physics of Fluids, NASA Tech Briefs, and Chemical Engineering Progress. He has three patents to his credit and is a licensed Professional Engineer in the State of Ohio. Dr. Reeder is an Associate Fellow of the AIAA and a member of ASME. Tel. 937-255-3636 x4530 (DSN 785-3636 x4530), email: [Mark.Reeder@afit.edu](mailto:Mark.Reeder@afit.edu)

**SPONSOR FUNDED RESEARCH PROJECTS**

"Design and Testing of Flapping-Wing Micro Air Vehicles." Sponsor: AFRL/RB. Funding: \$75,000.

"Continuation of Low Temperature Ablation Experiments and Analysis." Sponsor: AFRL/RB. Funding: \$19,344.

"Implementing Dry Ice Particle Seeding in the Trisonic Gasdynamics Facility." Sponsor: AFRL/RB. Funding: \$9,000.

#### REFEREED JOURNAL PUBLICATIONS

Gamble, B. and Reeder, M., "Experimental Analysis of Propeller Interactions with a Flexible Wing Micro Air Vehicle," AIAA Journal of Aircraft, Vol. 46, No. 1, pp. 65-73, January 2009.

Ol, M., Reeder, M., Fredberg, D., McGowan, G., Gopalarathnam, A., & Edwards, J., "Computation vs. Experiment for High-Frequency Low-Reynolds Number Airfoil Plunge," International Journal of Micro Air Vehicles, Vol. 1, No. 2, pp. 99-119, June 2009.

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Reynolds, T. and Reeder, M., "Variation of Flow Control Configurations to Improve Submerged Inlet Uniformity," AIAA Paper 2009-1259, Presented at the 47th AIAA Aerospace Sciences Meeting, Orlando, FL, 5-8 January 2009.

Curtis, D., Reeder, M., Svanberg, C., and Cobb, R., "Flapping Wing Micro Air Vehicle Bench Test Set-up," AIAA Paper 2009-1272, Presented at the 47th AIAA Aerospace Sciences Meeting, Orlando, FL, 5-8 January 2009.

Pitcher, N., Black, J., Reeder, M., and Maple, R. "Videogrammetry Dynamics Measurements of a Lightweight Flexible Wing in a Wind Tunnel," AIAA Paper 2009-2416.

Gosse, R., Callaway, D.W., Reeder, M., Nompelis, I., Candler, G., "Validation of an Equilibrium Ablation CFD Solver with Low Temperature Ablation Experiments Using Dry Ice," 4th Symposium on Integrating CFD and Experiments in Aerodynamics (von Karman Institute) 14-16 September 2009.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Served as Conference Chair and lead organizer for the Dayton-Cincinnati Aerospace Science Symposium.

#### **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 time-dependent material behavior, high-temperature structural materials, advanced composite materials, high-temperature structural design methods, and viscoplasticity. Dr. Ruggles-Wrenn has published over 80 journal articles and technical reports, and has co-authored 5 books on fatigue, fracture, and high temperature structural design methods. Dr. Ruggles-Wrenn received several research and best paper awards as well as the Col. Gage H. Crocker Outstanding Professor Award. Prior to joining AFIT Dr. Ruggles-Wrenn was a research staff member at the Oak Ridge National Laboratory (1987-2003). Dr. Ruggles-Wrenn is a member of the Editorial Board of Applied Composite Materials. She is also currently serving as an associate technical editor of the ASME Journal of Pressure Vessel Technology and has served in that capacity previously (1996-2002). She currently chairs the ASME PVPD Design & Analysis Technical Committee. Dr. Ruggles-Wrenn is a member of The American Ceramic Society and a Fellow of the ASME. Tel. 937-255-3636 x4641 (DSN 785-3636 x4641), email: [Marina.Ruggles-Wrenn@afit.edu](mailto:Marina.Ruggles-Wrenn@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

"Creep of Polycrystalline Yttrium Aluminum Garnet in Combustion Environments (Steam)." Sponsor: AFRL/RX. Funding: \$10,000.

"Effects of Steam Environment on Mechanical Behavior of SiC/SiC Ceramic Matrix Composites at Elevated Temperatures." Sponsor: AFRL/RX. Funding: \$7,425.

"Extension of the Viscoplasticity Theory Based on Overstress to Model Effects of Aging on Deformation." Sponsor: AFOSR. Funding: \$41,123.

#### REFEREED JOURNAL PUBLICATIONS

A. J. W. McClung and M. B. Ruggles-Wrenn, "Effect of Prior Aging at 288 °C in Argon Environment on Time – Dependent Deformation Behavior of a Thermoset Polymer at Elevated Temperature. Part 1: Experiments," *Journal of Applied Polymer Science*, Vol. 114, 2009, pp. 2956-2962.

A. J. W. McClung and M. B. Ruggles-Wrenn, "Effect of Prior Aging at 288 °C in Argon Environment on Time – Dependent Deformation Behavior of a Thermoset Polymer at Elevated Temperature. Part 2: Modeling with Viscoplasticity Theory Based on Overstress," *Journal of Applied Polymer Science*, Vol. 114, 2009, pp. 3389-3395.

A. J. W. McClung and M. B. Ruggles-Wrenn, "Strain Rate Dependence and Short-Term Relaxation Behavior of a Thermoset Polymer at Elevated Temperature: Experiment and Modeling," *Journal of Pressure Vessel Technology, Transactions ASME*, Vol. 131, No. 1, June 2009, pp. 031405-1 - 031405-8.

M. B. Ruggles-Wrenn and C. L. Genelin, "Effects of Environment on Creep Behavior of Nextel™720/Alumina-Mullite Ceramic Composite at 1200 °C," *Composites Science and Technology*, Vol. 69, No. 5, 2009, pp. 663-669.

C. M. Falcone and M. B. Ruggles-Wrenn, "Rate Dependence and Short-Term Creep Behavior of a Thermoset Polymer at Elevated Temperature," *Journal of Pressure Vessel Technology, Transactions ASME*, Vol. 131, No. 1, February 2009, pp. 011403-1 - 011403-8.

M. B. Ruggles-Wrenn and N. R. Szymczak, "Effects of Steam Environment on Compressive Creep Behavior of Nextel™720/Alumina Ceramic Composite at 1200 °C," *Composites Part A: Applied Science and Manufacturing*, Vol. 39, 2008, pp. 1829-1837.

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

T. Yeleser, M. B. Ruggles-Wrenn, G. E. Fair, and J. B. Davis, "Effects of Steam Environment on Creep Behavior of Nextel™610/Alumina Composite at 1100 °C," *Proceedings of the 33<sup>rd</sup> International Cocoa Beach Conference & Exposition on Advanced Ceramics & Composites*, Daytona Beach FL, January 18 – January 23, 2009.

V. Sharma and M. B. Ruggles-Wrenn, "Effects of Steam Environment on Fatigue Behavior of a SiC/SiNC Ceramic Matrix Composite at 1300 °C," *Proceedings of the 33<sup>rd</sup> International Cocoa Beach Conference & Exposition on Advanced Ceramics & Composites*, Daytona Beach FL, January 18 – January 23, 2009.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Chair, Design & Analysis Technical Committee, Pressure Vessels and Piping Division, American Society of Mechanical Engineers. 2005-present.

Associate Technical Editor, *Journal of Pressure Vessel Technology*, Transactions ASME.

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

**SHEARER, CHRISTOPHER M., Lt Col,**

Deputy Department Head and Assistant Professor of Aerospace Engineering, AFIT Appointment Date: September 2006 (AFIT/ENY); BS Aerospace Engineering, Texas A&M University, 1992, MS Aerospace Engineering, AFIT, 1997; PhD Aerospace Engineering, University of Michigan, 2006. Maj Shearer's research interests include computational and experimental structural dynamics of High Altitude Long Endurance (HALE) aircraft. He is also interested in flight dynamics and control of aircraft as well as aircraft design. Previous research has focused on Model Predictive Control (MPC) methods used on a nonlinear aircraft model, flight testing of auto ground collision avoidance systems, and HALE aircraft. He is a licensed FAA Certified Flight Instructor and a member of AIAA, Tau Beta Pi, and the Experimental Aircraft Association. Tel. 937-255-3636 x4643 (DSN 785-3636 x4643), email: [Christopher.Shearer@afit.edu](mailto:Christopher.Shearer@afit.edu)

**SPONSOR FUNDED RESEARCH PROJECTS**

"The Development of a Flexible Flying Sensorcraft for Code Validation of the Nonlinear Aeroelastic Simulation Toolbox and for Flight Control Architecture Development." Sponsor: AFRL/RB. Funding: \$55,000.

**OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES**

Active member of the Experimental Aircraft Association (EAA) and local chapters.

**SIMMONS, RONALD J., Lt Col,**

Assistant Professor of Aeronautical Engineering, Department of Aeronautics and Astronautics, AFIT Appointment Date: 2009 (AFIT/ENY); BS, Aeronautical Engineering & BS Astronautical Engineering, United States Air Force Academy, 1988; MS Aeronautical and Astronautical Engineering, Massachusetts Institute of Technology, 1990; PhD Aerospace Engineering, The Ohio State University, 2009. Lt Col Simons' research interests include astrodynamics, re-entry dynamics, space propulsion, and turbine propulsion. His dissertation work investigated the optimal design and control of a variable cycle turbine engine with an independently modulated third stream. He is a command pilot with over 4,000 hours in six aircraft, and has also served as a professor of Astronautics at the US Air Force Academy. Tel. 937-255-3636 x4723, e-mail: [Ronald.Simmons@afit.edu](mailto:Ronald.Simmons@afit.edu)

**SWENSON, ERIC D.,**

Assistant Professor of Aerospace Engineering, AFIT Appointment Date: August 2005 (AFIT/ENY); BS Civil Engineering, The Ohio State University, 1993, MS Astronautical Engineering, AFIT; PhD Aerospace Engineering, University of Texas at Austin, 2006. Lt Col Swenson's research includes computational and experimental structural dynamics of complex structures with passive and active damping. Previous research has focused on dynamics and control of spacecraft, highly accurate model tuning of satellites, and development damage detection techniques on geometrically constrained problems. He is a member of AIAA, Chi Epsilon, SPIE, and Tau Beta Pi. Tel. 937-255-3636 x4628 (DSN 785-3636 x4628), email: [eric.swenson@afit.edu](mailto:eric.swenson@afit.edu)

**SPONSOR FUNDED RESEARCH PROJECTS**

"Experimental Validation of Geometrically-Exact Beam Theory (GEBT)." Sponsor: AFRL/RB. Funding: \$18,000.

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Johnson, J. and Swenson, E., "A Persistent Monitoring System to Reduce Navy Aircraft Carrier Flight Deck Mishaps," *AIAA Guidance Navigation and Control*, 10-13 Aug, Chicago, IL, 2009.

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Simmons, J., Deleon, A., Black, J., Swenson, E., and Sauter, L., "Aeroelastic Analysis and Optimization of FalconLAUNCH Sounding Rocket Fins," *47<sup>th</sup> AIAA Aerospace Sciences Meeting*, 5-8 January, Orlando, FL, 2009.

Kuhn, J., Swenson, E., and Soni, S., "PZT Behavior in Cyclic Strain Environments," *Proceedings of SPIE's 16th International Symposium on Smart Structures and Materials*, March 2009, San Diego, CA.

Doupe, C., Swenson, E., George, L., and Black, J., "Measuring and Modeling 3D Mode Shapes of FalconSAT-5 Structural Engineering Model," *50th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials*, 4-7 May, Palm Springs, CA, 2009.

Green, N., Canfield, R., Swenson, E., Yu, W., and Blair, M., "Structural Optimization of Joined-Wing Beam Model with Bend/Twist Coupling Using Equivalent Static Loads," *50th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials*, 4-7 May, Palm Springs, CA, 2009.

Cooper, B.J., Black, J.T., Swenson, E.D., and Cobb, R.G., "Rigidizable Inflatable Get-Away-Special Experiment Post Flight Data Analysis," *50th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials*, 4-7 May, Palm Springs, CA, 2009.

Doupe, C., Swenson, E., George, L., and Black, J., "Measuring and Modeling 3D Mode Shapes of FalconSAT-5 Structural Engineering Model," *AIAA Modeling and Simulation Technologies Conference*, 10-13 Aug, Chicago, IL, 2009.

McFarland, C., Swenson, E., Fosbury, A., Black, J., and Cobb, R., "Near Real-Time Closed-Loop Optimal Feedback Control for Spacecraft Attitude Maneuvers," *AIAA Modeling and Simulation Technologies Conference*, 10-13 Aug, Chicago, IL, 2009.

Kahraman, M.O. and Swenson, E.D., "A Constraint Based Approach for Building Operationally Responsive Satellites," *4<sup>th</sup> International Conference on Recent Advances in Space Technologies (RAST)*, 11-13 June, Istanbul, Turkey, 2009.

#### **TORVIK, PETER J.,**

Professor Emeritus of Aerospace Engineering and Engineering Mechanics, Department of Aeronautics and Astronautics, (AFIT/ENY); BS, University of Minnesota, 1960; MS, University of Minnesota, 1962; PhD, University of Minnesota, 1965; BA, Wright State University, 1980. Professor Torvik is a specialist in theory of elasticity, wave propagation, shock and vibration, impact damage in aircraft systems, laser-material interactions, and aircraft survivability/ vulnerability. His primary research interests include structural dynamics, specifically, damping, impact, and penetration mechanics. Dr. Torvik is the author of over 100 technical papers and reports and some 30 other publications. He served as Head of the Department of Aeronautics and Astronautics, 1980-1990. He is the recipient of the AF Meritorious Civilian Service Award, the AF Exceptional Civilian Service Award, the Outstanding Civilian Career Service Award, USAF, and the John Leland Atwood Award and Medal, AIAA and ASME. Dr. Torvik is a Fellow of AIAA, a Fellow of the ASME, and a Fellow of Ohio Academy of Science. Tel. 937-255-3636 x4740 (DSN 785-3636 x4740), email: [Peter.Torvik@afit.edu](mailto:Peter.Torvik@afit.edu)



#### REFEREED JOURNAL PUBLICATIONS

Torvik, P. J., and J. Hansel, "Mechanical Properties of a Ceramic Coating with VEM Infiltration," *ASME Journal of Materials Science and Engineering*, Vol. 131, No. 3, pp. 031003-1-9, July 2009.

Torvik, P. J., "Determination of Mechanical Properties of Non-linear Coatings from Measurements with Coated Beams." *International Journal of Solids and Structures*, Vol. 46, No.5, pp. 1066-1077, March 2009.

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Filippi, S and P. J. Torvik, "A Methodology for Predicting the Response of Airfoils with Non-linear Coatings," *Proceedings: Propulsion-Safety and Affordable Readiness (P-SAR) Conference*, March, 2009.

#### **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 orbital mechanics and astrodynamics, chaotic systems, estimation and control, planetary astronomy, stability theory, and optimal control. Dr. Wiesel is the author of *Spaceflight Dynamics*, the leading introductory text on astronautical engineering. He has authored over 30 technical papers and has been a member of the department for 32 years. Tel. 937-255-3636 x4312 (DSN 785-3636 x4312), email: [William.Wiesel@afit.edu](mailto:William.Wiesel@afit.edu)

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Wiesel, W. E. "KAM Tori Normal Coordinates," AAS 09-395, *AAS/AIAA Astrodynamics Specialist Conference*, Pittsburgh, PA, 9-13 August 2009.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Secretary, Honors Society of Metropolitan Dayton.

## **5.2. DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING**

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<b>5.2.1</b>	<b><u>DOCTORAL DISSERTATIONS</u></b>	<b>69</b>
<b>5.2.2</b>	<b><u>MASTER'S THESES</u></b>	<b>69</b>
<b>5.2.3</b>	<b><u>GRADUATE RESEARCH PAPERS</u></b>	<b>74</b>
<b>5.2.4</b>	<b><u>FACULTY RESEARCH OUTPUT</u></b>	<b>75</b>

### 5.2.1. DOCTORAL DISSERTATIONS

BEARD, TODD W., *Application of Optimization Techniques to Spectrally Modulated, Spectrally Encoded Waveform Design*. AFIT/DEE/ENG/08-16. Faculty Advisor: Dr. Michael A. Temple. Sponsor: AFRL/RV.

CARLS, JOHN W., *A Framework for Analyzing Biometric Template Aging and Renewal Prediction*. AFIT/DCS/ENG/09-07. Faculty Advisor: Dr. Richard A. Raines. Sponsor: AFRL/RV.

FAROOQ, JAWAD, *Frequency Diversity for Improving Synthetic Aperture Radar Imaging*. AFIT/DEE/ENG/09-04. Faculty Advisor: Maj Michael A. Saville. Sponsor: AFRL/RV.

KELLY, DOUGLAS J., *A Taxonomy for and Analysis of Anonymous Communications Networks*. AFIT/DCS/ENG/09-08. Faculty Advisor: Dr. Richard A. Raines. Sponsor: NSA.

KLEIN, RANDALL W., *Application of Dual-Tree Complex Wavelet Transforms to Burst Detection and RF Fingerprint Classification*. AFIT/DEE/ENG/09-12. Faculty Advisor: Dr. Michael A. Temple. Sponsor: AFRL/RV.

LOUTHAIN, JAMES A., *Integrated Approach to Airborne Laser Communication*. AFIT/DEE/ENG/09-02. Faculty Advisor: Maj Jason D. Schmidt. Sponsor: AFMC & AFRL/RD.

OIMOEN, STEVEN C., *Dynamic Network Formation Using Ant Colony Optimization*. AFIT/DCS/ENG/09-06. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: AFOSR.

### 5.2.2. MASTER'S THESES

ALTIN, GOKHAN, *Bit-Error-Rate-Minimizing Channel Shortening Using Post-FEQ Diversity Combining and a Genetic Algorithm*. AFIT/GE/ENG/09-01. Faculty Advisor: Dr. Richard K. Martin. Sponsor: AFRL/RV.

AMATO, NICHOLAS J., *Modeling and Simulation Architecture for Studying Doppler-Based Radar With Complex Environments*. AFIT/GE/ENG/09-02. Faculty Advisor: Maj Michael A. Saville. Sponsor: 84 RADES.

ANTKOVIK, JASON L., *Uncertainty Estimate for Near Field to Far Field Transform Algorithm*. AFIT/GE/ENG/09-03. Faculty Advisor: Dr. Peter J. Collins. Sponsor: AFRL/RV.

ANTOSH, CORY J., *The Evaluation of Rekeying Protocols Within the Hubenko Architecture as Applied to Wireless Sensor Networks*. AFIT/GE/ENG/09-04. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: USAFA/DFEC.

BINGHAM, JASON K., *Vision-Aided Cooperative Navigation for Multiple Unmanned Vehicles*. AFIT/GE/ENG/09-05. Faculty Advisor: Lt Col Michael J. Veth. Sponsor: AFRL/RW.

BIRCHENOUGH, DENNIS R., *Classifying Emissions from GSM Communication Devices Using Entropy-Based RF Fingerprinting*. AFIT/GE/ENG/09-06. Faculty Advisor: Dr. Michael A. Temple. Sponsor: NSA.

BRAND, PAUL M., *Modeling of Wind Turbine Doppler Effects on Primary Search Radar*. AFIT/GE/ENG/09-07. Faculty Advisor: Maj Michael Mendenhall. Sponsor: 84 RADES.

BY, JASON, *Fusion of Inertial Sensors and Orthogonal Frequency Division Multiplexed (OFDM) Signals of Opportunity for Unassisted Navigation*. AFIT/GE/ENG/09-11. Faculty Advisor: Dr. Richard K. Martin. Sponsor: AFRL/RV.

CARLOS GONZALEZ, JUAN M., *An Efficient and Effective Implementation of the Trust System for Power Grid Compartmentalization*. AFIT/GCS/ENG/09-01. Faculty Advisor: Dr. Kenneth M. Hopkinson. Sponsor: AFRL/RI.

CIAMPA, MICHAEL A., *Failure Detection of a Pseudolite-Based Reference System Using Residual Monitoring*. AFIT/GE/ENG/09-08. Faculty Advisor: Dr. John Raquet. Sponsor: AFOSR.

COLEMAN, NICHOLAS R., *Micro-Scale Flapping Wings for the Advancement of Flying MEMS*. AFIT/GE/ENG/09-09. Faculty Advisor: Maj LaVern A. Starman. Sponsor: AFRL/RW.

CRANE, JAMES H., *Full-Wave Based Validation of Stripline Field Applicator for Low Frequency Material Measurements*. AFIT/GE/ENG/09-10. Faculty Advisor: Dr. Michael J. Havrilla. Sponsor: AFRL/RV.

DONNELL, BRIAN P., *Using Shadows to Detect Targets in Synthetic Aperture Radar Imagery*. AFIT/GE/ENG/09-12. Faculty Advisor: Maj Michael J. Mendenhall. Sponsor: AFRL/RV.

DULSKI, MICHAEL R., *Use of Multi-Conjugate Adaptive Optics on Aero-Optical and Free-Stream Turbulence*. AFIT/GE/ENG/09-13. Faculty Advisor: Maj Jason D. Schmidt. Sponsor: AFRL/RD.

DURHAM, CLIFTON M., *Evaluation of an OPNET Model for Unmanned Aerial Vehicle Networks*. AFIT/GCO/ENG/09-04. Faculty Advisor: Maj Todd R. Andel. Sponsor: AFRL/RI.

ELBAUM, JOSEPH M., *Cyber Power in the 21st Century*. AFIT/GCO/ENG/09-01. Faculty Advisor: Dr. Robert F. Mills. Sponsor: N/A.

ENGSTROM, NATHAN D., *Misregistration in Adaptive Optics Systems*. AFIT/GE/ENG/09-14. Faculty Advisor: Maj Jason D. Schmidt. Sponsor: AFRL/RD.

ERNSBERGER, PATRIC J., *Performance Enhancements of Ranging Radio Aided Navigation*. AFIT/GE/ENG/09-15. Faculty Advisor: Dr. John Raquet. Sponsor: Raytheon.

GALLAGHER, DANIEL M., *Surface Acoustic Wave Devices as Chemical Vapor Sensors*. AFIT/GE/ENG/09-16. Faculty Advisor: Lt Col Ronald A. Coutu. Sponsor: AFRL/RX.

GOCMEN, MURAT, *The Benefits of a Network Tasking Order in Combat Search and Rescue Missions*. AFIT/GCE/ENG/09-01. Faculty Advisor: Dr. Kenneth Hopkinson. Sponsor: N/A.

GONZALEZ, JOSE A., *Numerical Analysis for Relevant Features in Intrusion Detection (NARFid)*. AFIT/GCE/ENG/09-02. Faculty Advisor: Maj Michael Mendenhall. Sponsor: AFOIC.

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GROVES, SEAN G., *Predictive Control Using a priori Effective Wind Velocities in an Adaptive Optics System*. AFIT/EO/ENG/09-01. Faculty Advisor: Lt Col Gregory J. Toussaint. Sponsor: AFRL/RD.

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JORDAN, STEVEN P., *Range Estimation Algorithm Comparison in 3-D Flash LADAR Data*. AFIT/GE/ENG/09-22. Faculty Advisor: Dr. Stephen C. Cain. Sponsor: AFRL/R.Y.

KEEN, JONATHAN K., *Low Probability of Intercept Waveforms Via Intersymbol Dither Performance Under Multipath Conditions*. AFIT/GE/ENG/09-23. Faculty Advisor: Dr. Richard K. Martin. Sponsor: AFRL/R.Y.

KEICHEL, WILLIAM, *Two Dimensional Scattering Analysis of Data-Linked Support Strings for Bistatic Measurement Systems*. AFIT/GE/ENG/09-24. Faculty Advisor: Dr. Peter Collins. Sponsor: AFRL/R.Y.

KIM, HAN SEOK, *Removing Redundant Logic Pathways in Polymorphic Circuits*. AFIT/GCS/ENG/09-03. Faculty Advisor: Lt Col J. Todd McDonald. Sponsor: AFOSR.

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KIMBALL, WILLIAM A., *SecureQEMU: Emulation-based Software Protection Providing Encrypted Code Execution and Page Granularity Code Signing*. AFIT/GCO/ENG/09-03. Faculty Advisor: Dr. Rusty Baldwin. Sponsor: AFRL/R.Y.

KOSSLER, MAURICIO, *Patterning and Characterization of Carbon Nanotubes Grown in a Microwave Plasma Enhanced Chemical Vapor Deposition Chamber*. AFIT/GE/ENG/09-25. Faculty Advisor: Lt Col Ronald A. Coutu. Sponsor: N/A.

LAGOSKI, THOMAS J., *Retroreflector for Photonic Doppler Velocimetry*. AFIT/EO/ENG/09-02. Faculty Advisor: Lt Col Ronald A. Coutu. Sponsor: AFRL/RW.

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LIN, STEPHEN S., *Unified Behavior Framework in an Embedded Robot Controller*. AFIT/GCE/ENG/09-04. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: AFRL/R.Y.

McSHANE, JOHN D., *Application of Time-Frequency Representation to Non-Stationary Radar Cross Section*. AFIT/GE/ENG/09-28. Faculty Advisor: Dr. Peter Collins. Sponsor: 46th Test Wing.

MILLAR, JEREMY, *JIEDDO Incident Report Text Analysis*. AFIT/GCS/ENG/09-05. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: JIEDDO.

MONZ, ADRIAN, *Evaluation of Performance of a Maximum Likelihood Estimator for Tracking Purposes in the Presence of Speckle Noise*. AFIT/GE/ENG/09-29. Faculty Advisor: Maj Jason D. Schmidt. Sponsor: AFRL/RD.

MURPHY, SHERRY B., *Deceiving Adversary Network Scanning Efforts Using Host-Based Deception*. AFIT/ICW/ENG/09-04. Faculty Advisor: Lt Col Jeffrey McDonald. Sponsor: AFCYBER.

MUSTER, RICHARD T., *Exploitation of Geographic Information Systems for Vehicular Destination Prediction*. AFIT/GCE/ENG/09-05. Faculty Advisor: Maj Michael Mendenhall. Sponsor: AFRL/R.Y.

MUTLU, GUNER, *The Navigation Potential of Ground Feature Tracking*. AFIT/GE/ENG/09-52. Faculty Advisor: Dr. Meir Pachter. Sponsor: AFRL/R.Y.

O'DELL, ANTHONY P., *Detecting Near-Earth Objects Using Cross-Correlation with a Point Spread Function*. AFIT/GE/ENG/09-30. Faculty Advisor: Dr. Stephen C. Cain. Sponsor: AFRL/RD.

OQUENDO CLASS, LUIS A., *Optimized Robust Adaptive Networks in Supervisory Control and Data Acquisition Systems*. AFIT/GE/ENG/09-31. Faculty Advisor: Dr. Kenneth M. Hopkinson. Sponsor: AFOSR.

PAGEL, BRETT A., *Automated Virtual Machine Introspection for Host-Based Intrusion Detection*. AFIT/GCE/ENG/09-07. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: N/A.

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PORTER, ROY A., *Critical Technology Tamper Protection Through Dynamic Polymorphic Reconfiguration*. AFIT/GCE/ENG/09-08. Faculty Advisor: Dr. Yong C. Kim. Sponsor: AFRL/R.Y.

RAMSEY, BENJAMIN W., *Subjective Audio Quality Over a Secure IEEE 802.11n Draft 2.0 Wireless Local Area Network*. AFIT/GE/ENG/09-34. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: AFCA/DN.

REDERUS, LUKE A., *A MEMS Multi-Cantilever Variable Capacitor on Metamaterial*. AFIT/GE/ENG/09-35. Faculty Advisor: Maj LaVern A. Starman. Sponsor: AFMC.

REESE, CINDY C., *Decisive Routing and Admission Control According to Quality of Service Constraints*. AFIT/GE/ENG/09-36. Faculty Advisor: Dr. Kenneth Hopkinson. Sponsor: AFRL/RI.

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ROSAL, JOSEPH D., *Centralized Cooperative Control for Route Surveillance with Constant Communication*. AFIT/GE/ENG/09-38. Faculty Advisor: Lt Col Gregory J. Toussaint. Sponsor: AFRL/R.Y.

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SCHRADER, KARL R., *An FPGA-Based System for Tracking Digital Information Transmitted Via Peer-to-Peer Protocols*. AFIT/GCE/ENG/09-10. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: AFOIC.

SCHULTZ, ADAM M., *Low Frequency Synthesis Through Wavelet Optimization*. AFIT/GE/ENG/09-40. Faculty Advisor: Dr. Peter Collins. Sponsor: AFRL/RV.

SEARLES, EVAN T., *A Phenomenological Investigation of Synthetic Waveform Features for Non-Cooperative Exploitation*. AFIT/GE/ENG/09-41. Faculty Advisor: Dr. Michael A. Temple. Sponsor: AFRL/RV.

SEVY, BRADLEY D., *Using Covert Means to Establish Cybercraft Command and Control*. AFIT/GCS/ENG/09-07. Faculty Advisor: Lt Col J. Todd McDonald. Sponsor: AFOSR.

SEYMOUR, RICHARD S., *The Trust-Based Interactive Partially Observable Markov Decision Process*. AFIT/GCS/ENG/09-09. Faculty Advisor: Dr. Gilbert Peterson. Sponsor: AFRL/RV.

SHIELDS, JAMES H., *Power Generation by Harvesting Ambient Energy with a Micro-Electromagnetic Generator*. AFIT/GE/ENG/09-42. Faculty Advisor: Maj LaVern A. Starman. Sponsor: 711 HPW/RH.

SIMMONS, THOMAS E., *Characterization of Hardening by Design Techniques on Commercial, Small Feature Sized Field-Programmable Gate Arrays*. AFIT/GE/ENG/09-43. Faculty Advisor: Dr. Yong C. Kim. Sponsor: AFRL/RV.

SIMONAIRE, ERIC D., *Sub-circuit Selection and Replacement Algorithms Modeled as Term Rewriting Systems*. AFIT/GCO/ENG/09-02. Faculty Advisor: Lt Col J. Todd McDonald. Sponsor: AFOSR.

SMITH, MICHAEL J., *Electronic Image Stabilization for Mobile Robotic Vision Systems*. AFIT/GE/ENG/09-53. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: AFRL/RV.

STORMS, WILLIAM F., *Magnetic Field Aided Indoor Navigation*. AFIT/GE/ENG/09-44. Faculty Advisor: Dr. John F. Raquet. Sponsor: AFRL/RW.

SYLVESTER, CHRISTOPHER M., *System Identification of an on Orbit Spacecraft's Antenna Dynamics*. AFIT/GA/ENG/09-01. Faculty Advisor: Dr. Meir Pachter. Sponsor: SECAF.

TANNER, MICHAEL A., *Image Processing for Multiple-Target Tracking on a Graphics Processing Unit*. AFIT/GCE/ENG/09-11. Faculty Advisor: Dr. Yong C. Kim. Sponsor: AFRL/RV.

THEIS, NICHOLAS C., *The Modular Clock Algorithm for Blind Rendezvous*. AFIT/GCS/ENG/09-08. Faculty Advisor: Capt Ryan W. Thomas. Sponsor: AFRL/RV.

WABISZEWSKI, JR., MICHAEL G., *Enhancing Realistic Hands-On Network Training in a Virtual Environment*. AFIT/GCO/ENG/09-05. Faculty Advisor: Maj Todd R. Andel. Sponsor: 505 TRS FTU.

WEAVER, ADAM D., *Using Predictive Rendering as a Vision-Aided Technique for Autonomous Aerial Refueling*. AFIT/GE/ENG/09-45. Faculty Advisor: Lt Col Michael J. Veth. Sponsor: AFRL/RV.

WEBBER, FREDERICK C., *Precision Navigation Using Pre-Georegistered Map Data*. AFIT/GE/ENG/09-54. Faculty Advisor: Lt Col Michael J. Veth. Sponsor: AFRL/RV.

WEBER, JAMES R., *Modeling of DRFM Waveforms for Classification and Identification of Input Signals*. AFIT/GE/ENG/09-46. Faculty Advisor: Maj Michael A. Saville. Sponsor: NASIC.

WEIR, JOHN S., *Enhancing the NS-2 Network Simulator for Near Real-Time Control Feedback and Distributed Simulation Breaks*. AFIT/GE/ENG/09-47. Faculty Advisor: Lt Col Stuart Kurkowski. Sponsor: AFOSR.

WIGGINS, ARUBEY M., *Tactical Targeting Network Technology (TTNT) Modeling: MATLAB Physical and OPNET Network Layer Consistency*. AFIT/GE/ENG/09-48. Faculty Advisor: Dr. Michael A. Temple. Sponsor: AFRL/RW.

WILLIAMS, JASON A., *Characterizing Component Hiding Using Ancestral Entropy*. AFIT/GCE/ENG/09-12. Faculty Advisor: Lt Col J. Todd McDonald. Sponsor: AFOSR.

WITTHOEFT, BRIAN J., *Suite of Standards for Electromagnetic Material Characterization Using Mode Matching Theory*. AFIT/GE/ENG/09-49. Faculty Advisor: Dr. Michael J. Havrilla. Sponsor: AFRL/RV.

WOELFLE, MICHAEL T., *Bluetooth Radio Frequency (RF) Waveform Analysis and Classification Using RF Fingerprints*. AFIT/GCO/ENG/09-06. Faculty Advisor: Dr. Michael Temple. Sponsor: NSA.

YETISTI, CIGDEM, *Dynamic Interactions for Network Visualization and Simulation*. AFIT/GE/ENG/09-50. Faculty Advisor: Lt Col Stuart Kurkowski. Sponsor: AFOSR.

### **5.2.3. GRADUATE RESEARCH PAPERS**

BEEKER, KEVIN R., *Strategic Deterrence in Cyberspace: Practical Application*. AFIT/ICW/ENG/09-01. Faculty Advisor: Dr. Robert Mills. Sponsor: HQ USAF.

BIRDWELL, MICHAEL B., *If You Don't Know Where You Are Going, You Probably Will End Up Somewhere Else: Computer Network Operations Force Presentation*. AFIT/ICW/ENG/09-02. Faculty Advisor: Dr. Robert Mills. Sponsor: HQ USAF.

LARKOWSKI, MATTHEW P., *The Cyberspace Development Dogfight: Tightening the Acquisitions Turn Circle*. AFIT/ICW/ENG/09-03. Faculty Advisor: Dr. Robert Mills. Sponsor: HQ USAF.

PRINCIPI, PHILIP D., *Mitigating Tactical Warfighter Dependence on Link 16*. AFIT/ICW/ENG/09-05. Faculty Advisor: Dr. Robert Mills. Sponsor: HQ ACC & HQ USAF.



#### 5.2.4. FACULTY RESEARCH OUTPUT

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

##### **AKERS, GEOFFREY A., Maj,**

Instructor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2009 (AFIT/ENG), BS, Electrical Engineering, Missouri University of Science and Technology, 1996; MS, Electrical Engineering, Air Force Institute of Technology, 2000. His research interests include space-time adaptive processing, synthetic aperture radar, and direction finding. Tel. 937-255-3636 x4659 (DSN 785-3636 x4659), email: [Geoffrey.Akers@afit.edu](mailto:Geoffrey.Akers@afit.edu)

##### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Akers, G.A. and Stiles, J.M., "An Approach to Ground Moving Target Indication (GMTI) Using Multiple Resolutions of the Clutter Covariance Matrix," *2009 IEEE Radar Conference*, Pasadena, CA, USA, pp.1-5, 4-8 May 2009.

##### **ANDEL, TODD R., Maj,**

Assistant Professor of Computer Engineering, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2007 (AFIT/ENG), BSCE, University of Central Florida, 1998; MSCE, Air Force Institute of Technology, 2002; PhD 2007, Computer Science, Florida State University, 2006. His research interests include formal methods, secure routing protocols, and network simulation. Tel. 937-255-3636 x4901 (DSN 785-3636 x4901), email: [Todd.Andel@afit.edu](mailto:Todd.Andel@afit.edu)

##### SPONSOR FUNDED RESEARCH PROJECTS

"Using Formal Methods to Analyze Network Security Problems." Sponsor: AFOSR. Funding: \$36,270.

##### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

C. Durham, T. Andel, K. Hopkinson, and S. Kurkowski, "Evaluation of an OPNET Model for Unmanned Aerial Vehicle (UAV) Networks," *In Proceedings of 2009 Spring Simulation Multi-conference (SpringSim09)*, March 2009, p. 8.

K. Stewart, J. Humphries, and T. Andel, "Developing a Virtualization Platform for Courses in Networking, Systems Administration and Cyber Security Education," *In Proceedings of 2009 Spring Simulation Multi-conference (SpringSim09)*, March 2009, pp. 7.

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##### **BALDWIN, RUSTY O.,**

Professor of Computer Engineering, Associate Director, Center for Cyberspace Research, Department of Electrical and Computer Engineering, AFIT Appointment Date: 1999 (AFIT/ENG), BSEE, New Mexico State University, 1987; MS, Computer Engineering, Air Force Institute of Technology, 1992; PhD, Virginia Polytechnic Institute and State University, 1999. His research interests include computer communication networks, information warfare, performance modeling, and analysis and simulation of real-time communication systems. Tel. 937-255-6565 x4445 (DSN 785-6565 x4445), email: [Rusty.Baldwin@afit.edu](mailto:Rusty.Baldwin@afit.edu)

### SPONSOR FUNDED RESEARCH PROJECTS

"A Mathematical Framework for the Performance Evaluation of Large-Scale Sensor Networks." Sponsor: NSF. Funding: \$100,000. [CCR]

"Tactical SIGINT Technology Program (TST)." Sponsor: NSA. Funding: \$1,338,000. [CCR]

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C.R. Mann, R.O. Baldwin, J.P. Kharoufeh, and B. E. Mullins, "A Queueing Approach to Optimal Resource Replication in Wireless Sensor Networks," *Performance Evaluation*, Vol. 65, No. 10, pp. 689-700, October 2008. [CCR]

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S.J. Hopp, M.A. Temple, B.E. Mullins, and R.O. Baldwin, "Coexistent Performance Characterization of a Simulated GMSK System Using Operational Parameters," *2008 IEEE Military Communications Conference (MILCOM 2008)*, San Diego CA, November 2008, pp. C4.1-1-C4.1-6. [CCR]

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#### BOOKS AND CHAPTERS IN BOOKS

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#### **BORGHETTI, BRETT J., Lt Col,**

Assistant Professor of Computer Engineering, Department of Electrical and Computer Engineering, AFIT  
Appointment Date: 2008; (AFIT/ENG), BSEE, Worcester Polytechnic Institute (WPI), 1992; MSCS, Air Force Institute of Technology, 1996; PhD, Computer Science, University of Minnesota, 2006. His research interests include machine learning, autonomous agents, and multi-agent systems. Tel. 937-255-3636 x4612 (DSN 785-3636 x4612), email: [Brett.Borghetti@afit.edu](mailto:Brett.Borghetti@afit.edu)

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Weissgerber, K. and Borghetti, B.J., "Towards Automated Feature Selection in Real-Time Strategy Games," *GAMEON-North America (Winner, Best Paper Award)*, Atlanta, GA, August 2009.

#### **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. His research interests include electro-optics, remote sensing, and signal processing. Tel. 937-255-3636 x4625 (DSN 785-3636 x4625), email: [Stephen.Cain@afit.edu](mailto:Stephen.Cain@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

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O'Dell, A.P. and Cain, S.C., "Investigating the Effects of Atmospheric Seeing on the Detection of Near Earth Orbiting Asteroids," *IEEE Aerospace Conference 2008*, Big Sky, Montana, DOI: 10.1109/AERO.2009.4839455.

McMahon, J. R., Cain, S.C., and Martin, R.K. "Improving 3-D LADAR Range Estimation via Spatial Filtering," *IEEE Aerospace Conference 2008*, Big Sky, Montana, DOI: 10.1109/AERO.2009.4839451.

#### **COLLINS, PETER J.,**

Associate 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. His 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. Tel. 937-255-3636 x7256 (DSN 785-3636 x7256), email: [Peter.Collins@afit.edu](mailto:Peter.Collins@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

"Enabling Technologies for Radar Scattering Measurements." Sponsor: AFMC. Funding: \$50,000.

"Field Emission Technology Investigations." Sponsor: AS&T. Funding: \$184,000.

"RF/Optical/Thermal Metamaterials Research." Sponsor: AFRL/RX. Funding: \$29,300.

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Schmitt, A. and Collins, P.J., "Demonstration of a Network of Simultaneously Operating Digital Noise Radars," *IEEE Antennas and Propagation Magazine*, Vol. 51, No. 2, pp. 125-130, April 2009.

Collins, P.J. and McGuirk, J.S., "A Novel Methodology for Deriving Improved Material Parameter Sets for Simplified Cylindrical Cloaks," *Journal of Optics A: Pure and Applied Optics*, 11: 015104, 8 January 2009.

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McGuirk, J.S. and Collins, P.J., "Controlling the Transmitted Field into a Cylindrical Cloak's Hidden Region," *Optics Express*, 16: 17560-17573, 2008.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Kossler, M., Crossley B.L., Coutu, Jr., R.A., Starman, L.A., and Collins, P.J., "Study on the Effects of Hydrogen Pretreatment on Nickel Catalyst used for Multi-Walled Carbon Nanotube Growth," *Proceeding of SPIE Vol. 7399-03*, 2-6 August 2009.

Member, Technical Committee, *Antenna Measurement Techniques Association 31st Annual Symposium 2009*, May 2009.

Chairman, AFIT/ENG Low Observables Curriculum Committee.

Reviewer, *IEEE Transactions on Antennas and Propagation*.

Reviewer, *Journal of Electromagnetic Waves and Applications*.

Reviewer, *OSA Optics Express*.

Reviewer, *IET Electronic Letters*.

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**SPONSOR FUNDED RESEARCH PROJECTS**

"MEMS Anti-Temper Sensors." Sponsor: AFRL/RV. Funding: \$20,000.

"Micro-Contacts Study: Physics and Novel Materials." Sponsor: AFOSR. Funding: \$31,583.

"Microelectronics/MEMS Anti-Temper and Self Destruct Technologies." Sponsor: AFRL/RV. Funding:  
\$50,000.

"RF/Optical/Thermal Metamaterials Research." Sponsor: AFRL/RX. Funding: \$34,520.

"Semiconductor Physics and Device Reliability." Sponsor: AFRL/RV. Funding: \$20,000.

"Sensing, Control, and Modeling for a Quad-Winged Air Vehicle." Sponsor: TaiTech, Inc. Funding: \$9,998.

"Surface Acoustic Wave (SAW) Chem/Bio Sensors." Sponsor: AFRL/RX. Funding: \$20,000.

"Using MEMS Components in Miniaturized Warheads." Sponsor: AFRL/RW. Funding: \$10,000.

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Considers Material Deformation, Electron Transport, and Thin Film Characteristics," Paper No. 85,  
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MOEMS Applications," *Proceedings of the SPIE Photonics West Conference*, Vol. 7208-7, 2009.

Starman, L.A. and Coutu, Jr., R.A., "Residual Stress Monitoring of Post-Processed MEMS Fixed-Fixed  
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Conference*, pp. 18-27, June 2009.

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and Actuating MEMS Devices," *Proceedings of the 10<sup>th</sup> International Symposium on MEMS and  
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- Langley D., Coutu, Jr., R.A., Starman, L.A. and Rogers, S., "Optical Metamaterials for Photonics Applications," *Proceeding of SPIE Vol. 7468A-16*, 2-6 August 2009.
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- Roman, C, Starman, L.A. and Coutu, Jr., R.A., "Thermal Metamaterials," *USA RDECOM Workshop on Research and Evaluation of NEMS/MEMS*, Redstone Arsenal, AL, 8-9 September 2009.

#### **OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES**

- Coleman, N., Starman, L.A., and Coutu Jr., R.A., "Micro-Scale Flapping Wings," presented at the 34<sup>th</sup> *Annual Dayton-Cincinnati Aerospace Science Symposium*, Dayton, OH, 3 March 2009, Best Presentation Award Winner.
- Chabak, K., Starman L.A., and Coutu Jr., R.A., "Conceptual Study of Rotary-Wing Microrobotics," presented at the 34<sup>th</sup> *Annual Dayton-Cincinnati Aerospace Science Symposium*, Dayton, OH, 3 March 2009.

#### **DAVIS, NATHANIEL J. IV,**

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**SPONSOR FUNDED RESEARCH PROJECTS**

“Technical Support: Signal Processing/Pattern Recognition.” Sponsor: AFRL/RX. Funding: \$30,000.

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D. R. Parker, S. C. Gustafson, M. E. Oxley, and T. D. Ross, “Development of a Bayesian Framework for Determining Uncertainty in Receiver Operating Characteristic Curve Estimates,” *IEEE Transactions on Knowledge and Data Engineering*, January 2009.

**HARTRUM, THOMAS C.,**

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**SPONSOR FUNDED RESEARCH PROJECTS**

“Electromagnetic Analysis and Design of Non-Destructive Evaluation Systems.” Sponsor: AFRL/RX. Funding: \$52,754.

“Low Frequency High Temp Material Characterization System.” Sponsor: AFRL/RX. Funding: \$65,000.



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- Junqi Huang, Aihua W. Wood and Michael J. Havrilla, "A Hybrid Domain Decomposition – Finite Element Method for the Analysis of Transient Electromagnetic Scattering by an Over-filled Cavity in the Ground Plane," *Communications in Computational Physics*, vol. 5, no. 1, pp. 126-141, January 2009.
- J. Lee, M. Havrilla, M. Hyde, and E.J. Rothwell, "Scattering From a Cylindrical Resistive Sheet Using a Modified Physical Optics Current," *IET Proceedings - Microwaves, Antennas and Propagation*, vol. 2, no. 5, pp. 482-491, October, 2008.

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- J. Crane and M. Havrilla, "Effect of Center-Conductor Misalignment on Stripline Characteristic Impedance," *Applied Computational Electromagnetics Society (ACES) Conference Proceedings*, pp. 587-592, Monterey, California, March 2009.
- Michael J. Havrilla, "Full-wave Quasi-TEM Characteristic Impedance of an Imperfectly-conducting Strip Transmission Line," *IEEE International Symposium on Antenna Technology and Applied Electromagnetics Proceedings*, pp. 1-4, Banff, AB, Canada, February 2009.

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

- Edward J. Rothwell and Michael J. Havrilla, "An Accurate, Closed-form PO Approximation for the Current Induced in a Thin Resistive Strip," *URSI National Radio Science Meeting Abstracts*, Charleston, South Carolina, June 2009.
- Gary D. Dester, Edward J. Rothwell and Michael J. Havrilla, "Experimental Results and Error Analysis for a Two Iris, Full-Wave Material Characterization Method," *URSI National Radio Science Meeting Abstracts*, Charleston, South Carolina, June 2009.
- Gary D. Dester, Edward J. Rothwell and Michael J. Havrilla, "Experimental Results and Error Analysis for the Two Layer Material Characterization Method," *URSI National Radio Science Meeting Abstracts*, Charleston, South Carolina, June 2009.

#### **HEMMES, JEFFREY M., Maj,**

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D. Thain, C. Moretti, and J. Hemmes, "Chirp: A Practical Global Filesystem for Cluster and Grid Computing," *Journal of Grid Computing*, Volume 7, Issue 1, page 51, 1 March 2009, DOI: 10.1007/s10723-008-9100-5.

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#### **HOPKINSON, KENNETH M.,**

Assistant Professor of Computer Science, Department of Electrical and Computer Engineering, AFIT  
Appointment Date: 2004 (AFIT/ENG), BS, Computer Science, Rensselaer Polytechnic Institute, 1997; MS, Computer Science, Cornell University, 2002; PhD, Computer Science, Cornell University 2004. His research interests include distributed systems, networking, and simulation. Tel. 937-255-3636 x4579 (DSN 785-3636 x4579), email: [Kenneth.Hopkinson@afit.edu](mailto:Kenneth.Hopkinson@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

"A Context-Aware Middleware Architecture to Enable Large-Scale Networking." Sponsor: AS&T. Funding: \$130,529.

"HPC Summer Intern Support." Sponsor: AFOSR. Funding: \$26,550.

"Technical Support." Sponsor: AFRL/RI. Funding: \$30,000.

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Hopkinson, K., Roberts, G., Wang, X., Thorp, J., Quality of Service Considerations in Utility Communication Networks, *IEEE Transactions on Power Delivery*, Volume 24, Issue 3, July 2009, pp. 1465-1474.

Tong, X., Wang, X., Hopkinson, K.M., The Modeling and Verification of Peer-to-Peer Negotiating Multi-Agent Colored Petri Nets for Wide-Area Backup Protection, *IEEE Transactions on Power Delivery*, Volume 24, Issue 1, January 2009, pp. 61-72.

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Weir, J.S., Kurkowski, K.H., Hopkinson, K.M., Mediated User-Simulator Interactive Command with Visualization (MUSIC-V), *Spring Simulation Multiconference (SpringSim)*, 22-27 March 2009, San Diego, CA, USA, pp. 1-8.

Durham, C.M., Andel, T.R., Kurkowski, S.H., Hopkinson, K.M., Evaluation of an OPNET Model for Unmanned Aerial Vehicle (UAV) Networks, *Spring Simulation Multiconference (SpringSim)*, 22-27 March 2009, San Diego, CA, USA, pp. 1-8.

Coyne, M.E., Graham, S.R., Hopkinson K.M., Kurkowski, S.H., A Methodology for Unit Testing Actors in Proprietary Discrete Event Based Simulations, *Winter Simulation Conference*, 7-10 December 2008, Miami, FL, USA, pp. 1012-1019.

Belue, J.M., Kurkowski, S.H., Graham, S.R., Hopkinson, K.M., Thomas, R.W., Abernathy, J.W., Research and Analysis of Simulation-based Networks through Multi-Objective Visualization, *Winter Simulation Conference*, 7-10 December 2008, Miami, FL, USA, pp.1216-1224 .

Compton, M., Hopkinson, K., Graham, S., The Network Tasking Order (NTO), *IEEE MILCOM*, 17-19 November 2008, San Diego, CA, USA, pp. 1-7.

#### **HOUPIS, CONSTANTINE H.,**

Professor Emeritus of Electrical Engineering, Department of Electrical and Computer Engineering, (AFIT/ENG); BS, University of Illinois, 1947; MS, University of Illinois, 1948; PhD, University of Wyoming, 1971. His 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 system design, linear and nonlinear control theory, multivariable theory, and quantitative feedback theory. Professor Houpis has published numerous technical articles and textbooks. He is a registered professional engineer and a Fellow of the IEEE. Tel. 937-255-3636 x4615 (DSN 785-3636 x4615), email: [Constantine.Houpis@afit.edu](mailto:Constantine.Houpis@afit.edu)

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#### **SPONSOR FUNDED RESEARCH PROJECTS**

“Base Critical Infrastructure Protection (CIP) Research.” Sponsor: AFRL/RX. Funding \$98,000. [CCR]

#### **REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW**

Michael Stamat and Jeffrey Humphries, “Training ≠ Education: Putting Secure Software Engineering Back in the Classroom,” *14th Western Canadian Conference on Computing Education*, Burnaby, Canada, 1-2 May 2009.

Kyle Stewart, Jeffrey Humphries, and Todd Andel, “Developing a Virtualization Platform for Courses in Networking, Systems Administration and Cyber Security Education,” *Military Modeling and Simulation Symposium (MMS'09)*, San Diego, CA, 22-27 March 2009.

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#### **OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES**

“Large Integer Factorization and Cryptographic Security,” Virginia Military Institute, September 2009.

#### **JACKSON, JULIE A.,**

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**SPONSOR FUNDED RESEARCH PROJECTS**

“Anti-Tamper Methodology for Field Programmable Gate Arrays.” Sponsor: AFRL/RV. Funding: \$100,000.

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Yong C. Kim and J. Todd McDonald, “Considering Software Protection for Embedded Systems,” *Crosstalk: The Journal of Defense Software Engineering*, vol. 22, no. 6, pp. 4-8, September/October 2009.

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Roy Porter, Samuel J. Stone, Yong C. Kim, J. Todd McDonald, LaVern A. Starman, “Dynamic Polymorphic Reconfiguration for Anti-tamper Circuits,” *Proceedings of the IEEE International Conference on Field Programmable Logic and Applications (FPL 09)*, 493-497, Prague, Czech Republic, 31 August-2 September 2009.

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Samuel J. Stone, Roy Porter, Yong C. Kim, and Jason V. Paul, “A Dynamically Reconfigurable Field Programmable Gate Array Hardware Foundation for Security Applications,” *IEEE International Conference on Field Programmable Technology (ICFPT 2008)*, pp. 305-308, Taipei, Taiwan, December 2008.

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Thomas Simmons, Eugene Hockenberry, Yong Kim, and James Petrosky, “Performance Characterization of Design Hardening Techniques on Commercial FPGAs in Radiation Environments,” *27<sup>th</sup> Hardened Electronics and Radiation Technology Conference*, Albuquerque, NM, 31 March-3 April 2009.

Eric Lam, David Arnold, Yong Kim, and James Petrosky, "Evaluation of Retention Characteristics in Dynamic Random Access Memory Using Reconfigurable Computers for Low-Cost In Situ Radiation Reliability Testing," 27<sup>th</sup> *Hardened Electronics and Radiation Technology Conference*, Albuquerque, NM, 31 March-3 April 2009.

David Arnold, Eric Lam, John McClory, James Petrosky, and Yong Kim, "Evaluation Stability of Gamma Irradiated Synchronous Dynamic Random Access Memory (SDRAM)," 27<sup>th</sup> *Hardened Electronics and Radiation Technology Conference*, Albuquerque, NM, 31 March-3 April 2009.

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REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

D. Schmitt, S. Kurkowski, and M. Mendenhall, "Building Social Networks in Persistent Video Surveillance," in proceedings for IEEE International Conference on Intelligence and Security Informatics, ISI 2009, Dallas, Texas, 8-11 June 2009, pp. 217-219.

D. Schmitt, S. Kurkowski, and M. Mendenhall, "Automated Casing Event Detection in Persistent Video Surveillance," in proceedings for IEEE International Conference on Intelligence and Security Informatics, ISI 2009, Dallas, Texas, 8-11 June 2009, pp. 143-148.

Scott Weir, Stuart Kurkowski, and Kenneth Hopkinson, Mediated User-Simulator Interactive Command with Visualization (MUSIC-V), Communications and Networking Simulation Symposium (CN'09) San Diego, CA, 22-27 March 2009.

Clifton Durham, Todd Anzel, Kenneth Hopkinson, and Stuart Kurkowski, Evaluation of an OPNET Model for Unmanned Aerial Vehicle (UAV) Networks, Military Modeling and Simulation Symposium (MMS'09), San Diego, CA, 22-27 March 09.

Belue, J.M., Kurkowski, S.H., Graham, S.R., Hopkinson, K.M., Thomas, R.W., Abernathy, J.W., Research and Analysis of Simulation-based Networks through Multi-Objective Visualization, Winter Simulation Conference, 7-10 December 2008, Miami, FL, USA, pp.1216-1224.

Coyne, M.E., Graham, S.R., Hopkinson K.M., Kurkowski, S.H., A Methodology for Unit Testing Actors in Proprietary Discrete Event Based Simulations, Winter Simulation Conference, 7-10 December 2008, Miami, FL, USA, pp. 1012-1019.

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#### SPONSOR FUNDED RESEARCH PROJECTS

"Self Organized Multi-Agent Swarms for Network Security Control." Sponsor: AFRL/R.Y. Funding: \$80,000. [CCR]

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

E. Holloway, G. Lamont, and G. Peterson, "Network Security Using Self Organized Multi-Agent Swarms," *IEEE Symposium on Computational Intelligence in Cyber Security*, 2009.

#### **MARTIN, RICHARD K.,**

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Appointment Date: 2004 (AFIT/ENG), dual BS, Electrical Engineering and Physics, University of Maryland, 1999; MS, Electrical Engineering, Cornell University, 2001; PhD, Electrical Engineering, Cornell University, 2004. His research interests include cognitive radio, navigation and positioning, and laser radar. Tel. 937-255-3636 x4625 (DSN 785-3636 x4625), email: [Richard.Martin@afit.edu](mailto:Richard.Martin@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

"Laser Radar Range Resolution Enhancement Through 3D Registration and Deconvolution." Sponsor: AFOSR. Funding: \$36,200.

"Technical Support: Cognitive Networks Research." Sponsor: AFRL/R.Y. Funding: \$25,000.

"Technical Support: Navigation via Signals of Opportunity." Sponsor: AFRL/R.Y. Funding: \$15,000. [ANT]

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S.I. Husain, J. Yuan, J. Zhang, and R.K. Martin, "Time Domain Equalizer Design Using Bit Error Rate Minimization for UWB Systems," *EURASIP Journal on Wireless Communications and Networking*, vol. 2009, Article ID 786291, 11 pages, 2009.

R.K. Martin, J.S. Velotta, and J.F. Raquet, "Bandwidth Efficient Cooperative TDOA Computation for Multicarrier Signals of Opportunity," *IEEE Transactions on Signal Processing*, vol. 57, no. 6, June 2009, pp. 2311-2322, 2008.

R.K. Martin and M.E. Haker, "Reduction of Peak-to-Average Power Ratio in Transform Domain Communication Systems," *IEEE Transactions on Wireless Communications*, vol. 8, no. 9, September 2009, pp. 4400-4405.

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

J.R. McMahon, S.C. Cain, and R.K. Martin, "Improving 3-D LADAR Range Estimation via Image Deblurring," in *Proc. IEEE Aerospace Conference*, Big Sky, MT, March 2009, 9 pages.

R.K. Martin, C. Yan, and H.H. Fan, "Bounds on Decentralized TDOA-Based Localization of OFDM Sources," in *Proc. Int. Conf. on Acoustics, Speech, and Signal Proc. (ICASSP)*, Taipei, Taiwan, April 2009, 4 pages.

C. Yan, H.H. Fan, and R.K. Martin, "Robust NLOS Multipath Mitigation for TOA Estimation," in *Proc. Int. Conf. on Acoustics, Speech, and Signal Proc. (ICASSP)*, Taipei, Taiwan, April 2009, 4 pages.

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

J. Crosby, R.K. Martin, and J. Raquet, "Fusion of Inertial Sensors and Signals of Opportunity for Unassisted Navigation," *Proceeding of NAV08 / ILA37: The Navigation Conference & Exhibition*, Westminster, London, October 2008, 7 pages.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

G. Altin and R.K. Martin, "Adaptive MIMO Channel Shortening with Post-FEQ diversity combining," in *Proc. 42nd Asilomar Conf. on Signals, Systems, and Computers*, invited paper, Pacific Grove, CA, November 2008, 5 pages.

Member of Technical Program Committee, *The IEEE Vehicular Technology Conference*, September 2009.

Peer reviewer for 13 journal papers (*IEEE Trans. Signal Processing*, *IEEE Signal Processing Letters*, *IEEE Trans. Comm.*, *IEEE Trans. Wireless Comm.*, *IEEE Comm. Letters*, and *EURASIP J. on Advances in signal Processing*) and 10 conference papers (*IEEE Globecom*, *IEEE Vehicular Tech. Conf.*, *Crowncom*, *IEEE Milcom*, *IEEE MASS*, and *ICSPCS*).

#### **MAYBECK, PETER S.,**

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#### SPONSOR FUNDED RESEARCH PROJECTS

"Architectural Framework for Evaluating General, Efficient, and Measurable Program Protection." Sponsor: AFOSR. Funding: \$27,683. [CCR]

"AFIT Support for AFRL Cybercraft Project." Sponsor: AFOSR. Funding: \$50,000.

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J. Todd McDonald, Yong C. Kim, and Michael R. Grimaila. "Protecting Reprogrammable Hardware with Polymorphic Circuit Variation," *Proceedings of the 2<sup>nd</sup> Cyberspace Research Workshop 2009*, Shreveport, LA, June 2009.



James S. Okolica, J. Todd McDonald, Gilbert L. Peterson, Robert F. Mills, and Michael W. Haas<sup>+</sup>.  
“Developing Systems for Cyber Situational Awareness,” to appear, *Proceedings of the 2<sup>nd</sup> Cyberspace Research Workshop 2009*, Shreveport, LA, June 2009.

Hiren Patel, Yong C. Kim, J. Todd McDonald, LaVern Starman. “Increasing Stability and Distinguishability of the Digital Fingerprint in FPGAs Through Inputword Analysis,” to appear, *Proceedings of the IEEE International Conference on Field Programmable Logic and Applications (FPL 09)*, Prague, Czech Republic, 31 August-2 September 2009.

Roy Porter, Samuel J. Stone, Yong C. Kim, J. Todd McDonald, LaVern A. Starman. “Dynamic polymorphic reconfiguration for anti-tamper circuits,” to appear, *Proceedings of the IEEE International Conference on Field Programmable Logic and Applications (FPL 09)*, Prague, Czech Republic, 31 August-2 September 2009.

James Crouch, Hiren Patel, Yong C Kim, J. Todd McDonald, Tony C. Kim. “Creating digital fingerprints on commercial field programmable gate arrays,” *IEEE International Conference on Field Programmable Technology (ICFPT 2008)*, pp. 345-348, December 2008, Taipei, Taiwan.

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

J. Todd McDonald, Eric D. Trias, and Alan C. Lin. “Analyzing Functional Entropy of Software-Based Intent Protection Schemes,” *Proceedings of the 4th International Conference on Information Warfare and Security*, March 2009.

#### **MENDENHALL, MICHAEL J., Maj,**

Assistant Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT  
Appointment Date: 2006 (AFIT/ENG), BS in Computer Engineering, Oregon State University, 1996; MS in Computer Engineering, Air Force Institute of Technology, 2001; Ph.D. in Electrical Engineering, Rice University, 2006. His research interests include machine learning, hyperspectral image processing, and target detection focused on detecting and characterizing dismounts to include psycho-physiological responses. Tel. 937-255-3636 x4614 (DSN 785-3636 x4614), email: [Michael.Mendenhall@afit.edu](mailto:Michael.Mendenhall@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

"Effects of Atmospheric Uncertainty on Target Detection Algorithms." Sponsor: AFRL/RV. Funding: \$40,000.

"Exploration of Qualia Exploitation of Sensor Technology." Sponsor: AFRL/RB. Funding: \$30,000.

"Hyperspectral Exploitation of Sensor Technology." Sponsor: AFRL/RV. Funding: \$30,000.

"Skin Detection and Characterization and Data Visualization from Remote ISR Data." Sponsor: 711 HPW/RH. Funding: \$50,000.

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Gonzalez, J.A., Mendenhall, M.J., and Merenyi, E., “Minimum Surface Bhattacharyya Feature Selection,” *First Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing, IEEE WHISPERS*, Grenoble France, 26-28 August 2009.

Howard, T.E., Mendenhall, M.J., and Peterson, G.L., “Abstracting GIS Layers from Hyperspectral Imagery,” *First Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing, IEEE WHISPERS*, Grenoble France, 26-28 August 2009.

Vongsy, K.M., Mendenhall, M.J., Hanna, P.M., Kaufmann, J.R., "Change Detection Using Synthetic Hyperspectral Imagery," *First Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing, IEEE WHISPERS*, Grenoble France, 26-28 August 2009.

Mendenhall, M.J. and Merenyi, E., "On the Evaluation of Synthetic Hyperspectral Imagery," *First Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing, IEEE WHISPERS*, Grenoble France, 26-28 August 2009.

Nunez, A.S., Mendenhall, M.J., and Gross, K.C., "Melanosome Level Estimation in Human Skin from Hypersepctral Imagery," *First Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing, IEEE WHISPERS*, Grenoble France, 26-28 August 2009.

Nunez, A.S., Mendenhall, M.J., and Bertram, H., "Building an Integumentary System Hyperspectral Model for Avatars," *First Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing, IEEE WHISPERS*, Grenoble France, 26-28 August 2009.

Klein, R.A., Temple, M.A., Mendenhall, M.J., and Reising, D.R., "Sensitivity Analysis of Burst Detection and RF Fingerprinting Classification Perf," *2009 IEEE Int'l Conf on Comm (ICC 2009)*, Dresden, Germany, June 2009.

Millar, J.R., Peterson, G.L., and, Mendenhall, M.J., "Document Clustering and Visualization with Latent Dirichlet Allocation and Self-Organizing Maps," *The 22nd International FLAIRS Conference*, Sanibel Island, FL, May 2009.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Nunez, A.S., and Mendenhall, M.J., "Guest Lecture on Remote Sensing of Human Skin and Its Chromophores." College of Charleston, Charleston S.C., May 2009.

Mendenhall, M.J., and Kerekes' J., Special Session on Exploitation Algorithms Using Synthetic Hyperspectral Data, *First Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing, IEEE WHISPERS*, Grenoble France, 26-28 August 2009.

#### **MILLS, ROBERT F.,**

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#### SPONSOR FUNDED RESEARCH PROJECTS

"Cyberspace Situational Awareness." Sponsor: 711 HPW/RH. Funding: \$40,000. [CCR]

"Insider Threat Detection Using Information System and Infrastructure Log Files." Sponsor: NSA. Funding: \$34,574. [CCR]

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Marsh, D.W., Baldwin, R.O., Mullins, B.E., Mills, R.F., and Grimaila, M.R., "A Security Policy Language for Wireless Sensor Networks," *Journal of Systems and Software*, January 2009, Vol. 82, No. 1, pp. 101-111. [CCR]



Hamill, J.T., Deckro, R.F., Mills, R.F., and Chrissis, J.W., "Reach-Based Assessment of Position," Military Operations Research, Vol. 13, No. 4, 2008, pp. 59-78. [COA]

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

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Myers, J., Grimaila, M.R., and Mills, R.F., "Towards Insider Threat Detection using Web Server Logs," Proceedings of the Cyber Security and Information Intelligence Research Workshop (CSIIRW 2009), Oak Ridge National Laboratory, Oak Ridge, TN, 13-15 April 2009. [CCR]

Grimaila, M.R., Fortson, L.W., Sutton, J.L., and Mills, R.F., "Developing Methods for Timely and Relevant Mission Impact Estimation," Proceedings of the 2009 SPIE Defense, Security and Sensing Conference (SPIE DSS 2009), Orlando, Florida, 13-17 April 2009. [CCR]

Lacey, T.H., Peterson, G.L., and Mills, R.F., "The Enhancement of Graduate Digital Forensics Education via the DC3 Digital Forensics Challenge," Hawaii International Conference on System Sciences (HICSS-42), Big Island, HI, January 2009, pp. 1-9. [CCR]

Suski, W.C., Temple, M.A., Mendenhall, M.J., and Mills, R.F., "Using Spectral Fingerprints to Improve Wireless Network Security," 2008 IEEE Global Communication Conference (GLOBECOMM 08), Computer and Communications Security Symposium. [CCR]

Kaun, M.D., Temple, M.A., Mills, R.F., and Mendenhall, M.J., "Exploiting the Electromagnetic Environment (EME) Using Entropy-Based Time-Frequency Techniques," 2008 Military Communications Conference (MILCOM-2008), Classified Session. [CCR]

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Okolica, J.S., McDonald, J.T., Peterson, G.L., Mills, R.F., and Haas, M.W., "Developing Systems for Cyber Situational Awareness," 2nd Cyberspace Research Workshop, Shreveport LA, 15 June 2009.

#### BOOKS AND CHAPTERS IN BOOKS

Schrader, K., Mullins, B., Peterson, G. and Mills, R., "Tracking Contraband Files Transmitted Using Bit-torrent," *Advances in Digital Forensics V*, S. Sheno and G. Peterson, Eds., New York, NY: Springer Science+Business Media, 2009, pp. 159-174. [CCR]

Mills, R.F., Peterson, G.L., and Grimaila, M.R., "Insider Threat Prevention, Detection, and Mitigation," *Cyber-Security and Global Information Assurance: Threat Analysis and Response Solutions*, K. Knapp, ed., IGI Global Publishing, March 2009, pp. 48-74 [CCR]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

USAF Future Games Planning Meeting, Colorado Springs, CO, June 2009.

"AFIT IA and Cyber Education Programs," Aeronautical Systems Center, Information Assurance for Weapon Systems Workshop, 4 December 2008.

**MULLINS, BARRY E.,**

Assistant Professor of Computer Engineering, Department of Electrical and Computer Engineering, AFIT  
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1983; MS Computer Engineering, Air Force Institute of Technology, 1987; PhD (Electrical Engineering),  
Virginia Polytechnic Institute and State University, 1997. His research interests include cyber operations,  
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**SPONSOR FUNDED RESEARCH PROJECTS**

“Air Force Communication Systems Modeling.” Sponsor: Air Force Communications Agency. Funding:  
\$17,000. [CCR]

**REFEREED JOURNAL PUBLICATIONS**

Karrels, D. R., Peterson, G. L., and Mullins, B. E., “Structured P2P Systems for Distributed Command and Control,” *Peer-to-Peer Networking and Applications*, 7 March 2009, DOI 10.1007/s12083-009-0033-y, pp. 1-23. [CCR]

Mullins, B. E., Seyba, J. R., Raines, R. A., Ramsey, B. W., and Williams, P. D., “Voice and Video Capacity of a Secure IEEE 802.11g Wireless Network,” *Mobile Computing and Communications Review*, Vol. 13, No. 1, January 2009, pp. 26-34. [CCR]

Marsh, D. W., Baldwin, R. O., Mullins, B. E., Mills, R. F., and Grimaila, M. R., “A Security Policy Language for Wireless Sensor Networks,” *Journal of Systems and Software*, Vol. 82, No. 1, January 2009, pp. 101-111. [CCR]

Phillips, A. N., Mullins, B. E., Raines, R. A., and Baldwin, R. O., “A Secure Group Communication Architecture for Autonomous Unmanned Aerial Vehicles,” *Security and Communication Networks*, DOI: 10.1002/sec.55, October 2008, pp. 55-69. [CCR]

Mann, C. R., Baldwin, R. O., Kharoufeh, J. P., and Mullins, B. E., “A Queueing Approach to Optimal Resource Replication in Wireless Sensor Networks,” *Performance Evaluation*, Vol. 65, No. 10, October 2008, pp. 689-700. [CCR]

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Kelly, D. J., Raines, R. A., Baldwin, R. O., Mullins, B. E., and Grimaila, M. R., “Towards a Taxonomy of Wired and Wireless Anonymous Networks,” *IEEE International Communications Conference 2009*, Dresden Germany, June 2009, pp. 1-8. [CCR]

Santos, L. N. P., Mullins, B. E., Baldwin, R. O., and Thomas, R. W., “VoIP over MANETS: A Performance Analysis of OLSR,” *4<sup>th</sup> International Conference on Information Warfare and Security (ICIW 2009)*, Breakwater Lodge, Cape Town, South Africa, 26-27 March 2009, pp. 90-100. [CCR]

Wabiszewski, M. G., Andel, T. R., Mullins, B. E., and Thomas, R. W., “Enhancing Realistic Hands-On Network Training in a Virtual Environment,” *Military Modeling and Simulation Symposium (MMS'09)*, San Diego CA, 22-27 March 2009, pp. 1-8. [CCR]

Lidowski, R. L., Mullins, B. E., and Baldwin, R. O., “A Novel Communications Protocol Using Geographic Routing for Swarming UAVs Performing a Search Mission,” *Seventh IEEE International Conference on Pervasive Computing and Communications*, Galveston, TX, 9-13 March 2009, pp. 162-168. [CCR]

Kelly, D. J., Raines, R. A., Baldwin, R. O., Mullins, B. E., and Grimaila, M. R., “Towards a Tree-based Taxonomy of Anonymous Networks,” *6<sup>th</sup> Annual IEEE Consumer Communications & Networking Conference (CCNC 2009)*, Las Vegas, Nevada, 10-13 January 2009, pp. 1-2. [CCR]

Kelly, D. J., Raines, R. A., Baldwin, R. O., Mullins, B. E., and Grimaila, M. R., "Towards Mathematically Modeling the Anonymity Reasoning Ability of an Adversary," *27<sup>th</sup> IEEE International Performance Computing and Communications Conference/Workshop on Information and Data Assurance*, Austin TX, December 2008, pp. 1-8. [CCR]

Ramsey, B. W., Mullins, B. E., Thomas, R. W., and Andel, T. R., "Subjective Audio Quality over Secure IEEE 802.11 Wireless Local Area Networks," *1<sup>st</sup> IEEE International Workshop on Network Security and Privacy* in conjunction with the *IEEE IPCCC 2008 (27<sup>th</sup> IEEE International Performance Computing and Communications Conference)*, Austin TX, 7-9 December 2008, pp. 469-474. [CCR]

Antosh, C. J., and Mullins, B. E., "The Scalability of Secure Lock," *1<sup>st</sup> IEEE International Workshop on Information and Data Assurance* in conjunction with the *IEEE IPCCC 2008 (27<sup>th</sup> IEEE International Performance Computing and Communications Conference)*, Austin TX, 7-9 December 2008, pp. 507-512, Best Paper Award. [CCR]

Hopp, S. J., Temple, M. A., Mullins, B. E., and Baldwin, R. O., "Coexistent Performance Characterization of a Simulated GMSK System Using Operational Parameters," *IEEE Military Communications Conference (MILCOM 2008)*, San Diego CA, November 2008, pp. 1-5. [CCR]

Kelly, D. J., Raines, R. A., Grimaila, M. R., Baldwin, R. O., and Mullins, B. E., "A Survey of State-of-the-Art in Anonymous Metrics," *First ACM Workshop on Network Data Anonymization (NDA 2008)*, Alexandria VA, 31 October 2008, pp. 1-9. [CCR]

#### BOOKS AND CHAPTERS IN BOOKS

Schrader, K. R., Mullins, B. E., Peterson, G. L., and Mills, R. F., "A Digital Forensic Tool for Detecting and Tracking Contraband Digital Files Transmitted Via the BitTorrent Peer-to-Peer Protocol," *Advances in Digital Forensics V*, S. Sheno, and P. Craiger, eds., Springer Science+Business Media, New York, NY, 2009, pp. 159-174. [CCR]

Marsh, D. W., Baldwin, R. O., and Mullins, B. E., "Wireless Sensor Network Authorization Specification Language: A Formal Model," *Security in Ad-hoc and Sensor Networks*, World Scientific Press, July 2009, pp. 333-368. [CCR]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Reviewer, *Military Operations Research Journal*.

Reviewer, *International Journal of Critical Infrastructure Protection*, Elsevier Publishers.

Member, Technical Program Committee for the *Wireless Networking Symposium (WNS)* at *2009 IEEE Global Communications Conference (GLOBECOM 2009)*.

Member, Technical Program Committee for the *4<sup>th</sup> International Conference on Information Warfare and Security (ICIW 2009)*.

Pagel, B. A., and Mullins, B. E., "Virtualization: The Supermax Prison for Your Computer," Air University Blue Dart, March 2009. [CCR]

Santos, L. N. P., and Mullins, B. E., "Using Mobile Ad Hoc Networks for Communications," Air University Blue Dart, March 2009. [CCR]

Antosh, C. J., and Mullins, B. E., "AFIT Research Supports Replacement of Landmines," Air University Blue Dart, March 2009. [CCR]

Schrader, K. R., and Mullins, B. E., "TRAPPING Contraband File Sharers on Government Networks," Air University Blue Dart, February 2009. [CCR]

Ramsey, B. W., and Mullins, B. E., "VoIP: I Can Hear You Now, but So Can the Enemy," Air University Blue Dart, November 2008, Top Student Blue Dart for CY2008. [CCR]

Schrader, K. R., Mullins, B. E., Peterson, G. L., and Mills, R. F., "TRAPP: A Forensic Tool for Detecting and Tracking Contraband Digital Information Transmitted Via Peer-to-Peer Protocols," presented at the *Fourth Annual Dayton Engineering Sciences Symposium*, Wright State University, Dayton OH, 27 October 2008. Best Presentation in Computer Sciences. [CCR]

Ramsey, B. W., Mullins, B. E., Thomas, R. W., and Andel, T. R., "Subjective Audio Quality over Secure IEEE 802.11 Wireless Local Area Networks," presented at the *Fourth Annual Dayton Engineering Sciences Symposium*, Wright State University, Dayton OH, 27 October 2008. [CCR]

Santos, L. N. P., Mullins, B. E., Baldwin, R. O., and Thomas, R. W., "VoIP over MANETS: A Performance Analysis of OLSR," presented at the *Fourth Annual Dayton Engineering Sciences Symposium*, Wright State University, Dayton OH, 27 October 2008. [CCR]

### **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 the 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. For his work on adaptive and reconfigurable flight control, he received the AF Air Vehicle's Directorate Foulis award for 1994, together with Phil Chandler and Mark Mears. Tel. 937-255-3636 x7247 (DSN 785-3636 x4593), email: [Meir.Pachter@afit.edu](mailto:Meir.Pachter@afit.edu)

### **SPONSOR FUNDED RESEARCH PROJECTS**

"Cooperative Intelligent Control and Estimation." Sponsor: AFOSR. Funding: \$46,855.

"New Navigation Techniques." Sponsor: AFRL/RV. Funding: \$15,000. [ANT]

"Planning, Guidance and Control for Multiple UAV Cooperative Operations." Sponsor: AFRL/RB. Funding: \$10,000.

### **REFEREED JOURNAL PUBLICATIONS**

M. Pachter, "A Revisit of Linear-Quadratic Optimal Control," *Journal of Optimization Theory and Applications*, Vol. 140, No 2, January 2009, pp. 301-314.

S. Yadlapalli, W. A. Malik, S. Dharba, and M. Pachter, "A Lagrangian-Based Algorithm for a Multiple Depot, Multiple Traveling Salesmen Problem," *Nonlinear Analysis: Real World Applications*, Vol. 10, 2009, pp.1990-1999.

### **REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW**

M. Pachter and P. Shelnutt: "Obstacle Avoidance Using Optical Flow Balancing and Looming," *49th Israel Annual Conference on Aerospace Sciences*, 4-5 March 2009, Tel Aviv, Israel.

M. Pachter and V. Barba: "Antenna Robust Controller Design Using Feedforward Action for Accurate Pointing Onboard a Spacecraft," *6th IFAC Symposium on Robust Control Design ROCOND 09*, Haifa, Israel, 16-18 June 2009.

#### BOOKS AND CHAPTERS IN BOOKS

P. Chandler and M. Pachter, "Challenges" *Unmanned Aerial Vehicles Cooperative Decision and Control: Challenges and Practical Approaches*, T. Shima and S. Rasmussen, editors, published by SIAM, 2009, pp. 15-35.

B. Kish, M. Pachter, and D. Jacques, "Effectiveness Measures for Operations in Uncertain Environments," in *Unmanned Aerial Vehicles Cooperative Decision and Control: Challenges and Practical Approaches*, T. Shima and S. Rasmussen, editors, published by SIAM, 2009, pp. 104-124.

M. Pachter, "The LQG Game Against Nature," *Advances in Dynamic Games and Their Applications*, P. Bernhard, V. Gaitsgory, and O. Pourtallier, editors., et al., Birkhauser, 2009, pp. 339-353.

J. Bode, D. Jacques, and M. Pachter, "Optimal Control of the Weapon Operating Characteristic with Control Inequality Constraints," to appear in *Optimization and Cooperative Control Strategies*, LNCS, Springer, 2009.

J. Baker, R. Holsapple, A. Girard, M. Pachter and P. Chandler: "Operator - Aided Decision Processes for Unmanned Aerial Vehicles in a Stochastic Environment," to appear in *Optimization and Cooperative Control Strategies*, LNCS, Springer, 2009.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Dr. Pachter has held research and teaching positions at the Israel Institute of Technology, the Council for Scientific and Industrial Research in South Africa, Virginia Polytechnic Institute, Harvard University, and Integrated Systems, Inc.

#### **PETERSON, GILBERT L.,**

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#### SPONSOR FUNDED RESEARCH PROJECTS

"AFIT Analysis Support to JIEDDO, Task 2a." Sponsor: JIEDDO. Funding: \$116,760. [COA]

"CyberCraft Environment Modeling for C3." Sponsor: AFRL/RI. Funding: \$221,130. [CCR]

"INSeCT: Intelligent Navigation and Sensing Cooperative Tasks." Sponsor: AFRL/RV. Funding: \$100,000. [ANT]

"Semi-Autonomous Lead Vehicle for Convoy Operations." Sponsor: JIEDDO. Funding: \$100,000. [ANT]

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Karrels, D., Peterson, G.L., and Mullins, B.E., "Structured P2P Technologies for Distributed Command and Control," *Peer-to-Peer Networking and Applications*, vol. 2, no. 4, pp. 311-333, 2009. [CCR]

Woolley, B., Peterson, G.L., "Unified Behavior Framework for Reactive Robot Control," *Journal of Intelligent and Robotic Systems*, vol. 55, no. 2, pp.155-176, 2009. [ANT]

Stevens, M., Williams, P.D., Peterson, G.L., and Kurkowski, S.H., "Integrating Trust into the CyberCraft Initiative via the Trust Vectors Model," *IEEE Computational Intelligence Magazine*, vol. 3, no. 2, pp. 65-68, 2008. [CCR]

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Karrels, D.R., Peterson, G.L., and Mullins, B.E., "RC-Chord: Resource Clustering in a Large-Scale Hierarchical Peer-to-Peer System," *MILCOM 2009*, pp. 860-864, 2009. [CCR]

Seymour, R.S., and Peterson, G.L., "A Trust-based Multiagent System," *2009 IEEE International Conference on Privacy, Security, Risk and Trust (PASSAT-09)*, September 2009, pp. 109-116. [CCR]

Okolica, J.S., McDonald, J.T., Peterson, G.L., Mills, R.F., and Haas, M.W., "Developing Systems for Cyber Situational Awareness," *Proceedings of the 2nd Cyberspace Research Workshop*, July 2009, pp. 46-56. [CCR]

Howard, T., Mendenhall, M., and Peterson, G.L., "Abstracting GIS Layers from Hyperspectral Imagery," *First Workshop on Hyperspectral Image and Signal processing: Evolution in Remote Sensing (IEEE WHISPERS)*, Grenoble France, August 2009.

Millar, J.R., Peterson, G.L., and Mendenhall, M.J., "Document Clustering and Visualization with Latent Dirichlet Allocation and Self-Organizing Maps," *The 22<sup>nd</sup> International FLAIRS Conference*, Sanibel Island, FL, May 2009, pp. 69-74. [CCR]

Seymour, R.S., and Peterson, G.L., "Responding to Sneaky Agents in Multi-agent Domains," *The 22<sup>nd</sup> International FLAIRS Conference*, Sanibel Island, FL, May 2009, pp. 99-104. [CCR]

Hooper, D., and Peterson, G.L., "HAMR: A Hybrid Multi-Robot Control Architecture," *The 22<sup>nd</sup> International FLAIRS Conference*, Sanibel Island, FL, May 2009, pp. 139-140. [ANT]

Holloway, E.M., Lamont, G.B., and Peterson, G.L., "Military Network Security Using Self Organized Multi-Agent Swarms," *IEEE Symposium on Computational Intelligence in Cyber Security*, pp. 2559-2566, 2009. [CCR]

Lacey, T., Peterson, G.L., and Mills, R.F., "The Enhancement of Graduate Digital Forensics Education via the DC3 Digital Forensics Challenge," *Hawaii International Conference on System Sciences (HICSS)*, Big Island, HI, January 2009, pp. 1-9. [CCR]

Boxerbaum, A., Oro, J., Peterson, G.L., Quinn R.D., "The Latest Generation Whegs™ Robot Features a Passive-Compliant Body Joint," *2008 IEEE/RSJ International Conference on Intelligent Robots and Systems*, pp. 1636-1641. [ANT]

#### BOOKS AND CHAPTERS IN BOOKS

Shenoi, S., and Peterson, G.L., *Advances in Digital Forensics V*, New York, NY: Springer Science+Business Media, 2009. [CCR]

Schrader, K.F., Mullins, B.E., Peterson, G.L., and Mills, R.F., "Tracking Contraband Files Transmitted Using BitTorrent," *Advances in Digital Forensics V*, S. Shenoi and G. Peterson, Eds., New York, NY: Springer Science+Business Media, 2009, pp. 159-174. [CCR]

## OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

*Co-Chair*, Fifth Annual IFIP WG 11.9 International Conference on Digital Forensics.

*Vice-Chair*, International Federation for Information Processing, Working Group 11.9-Digital Forensics.

### **POTOCZNY, HENRY B.,**

Professor of Computer Science, Department of Electrical and Computer Engineering, AFIT Appointment Date: 1981 (AFIT/ENG); BA, La Salle University, 1965; MA, University of Kentucky, 1967; PhD, University of Kentucky, 1969. Dr. Potoczny's interests include logic and number theory, specifically, novel methods of factoring large integers with a view to cracking various public key ciphersystems. Tel. 937-255-6565 x4282 (DSN 785-6565 x4282), email:

[Henry.Potoczny@afit.edu](mailto:Henry.Potoczny@afit.edu)

### **PYATI, VITTAL P.,**

Professor Emeritus of Electrical Engineering, Department of Electrical and Computer Engineering, (AFIT/ENG); BE, University of Madras, India, 1953; MSEE, Marquette University, 1962; PhD, Electrical Engineering, University of Michigan, 1966. Dr. Pyati's fields of expertise include electromagnetics, radar, low observables, and electronic warfare. Dr. Pyati has authored over 40 publications in journals and DoD conferences. He has been a consultant to various Air Force organizations.

### **RAINES, RICHARD A.,**

Director, Center for Cyberspace Research, Professor of Electrical Engineering, and DoD Force Transformation Chair, Department of Electrical and Computer Engineering, AFIT Appointment Date: 1994 (AFIT/ENG), BSEE, Florida State University 1985; MS, Computer Engineering, Air Force Institute of Technology, 1987; PhD, Virginia Polytechnic Institute and State University, 1994. His research interests include computer communication networks, satellite communications, performance modeling, information security, and system threat and vulnerability. Tel. 937-255-6565 x4278 (DSN 785-6565 x4278), email:

[Richard.Raines@afit.edu](mailto:Richard.Raines@afit.edu)

## SPONSOR FUNDED EDUCATIONAL PROJECTS

"IASP Tuition and Resource Support for the AFIT Center for Cyberspace Research." Sponsor: NSA.  
Funding: \$373,647. [CCR]

## REFEREED JOURNAL PUBLICATIONS

B. D. Birrer, R. A. Raines, R. O. Baldwin, M. Oxley, and S. K. Rogers, "Using Qualia and Multi-Layered Relationships in Malware Detection," *Journal of Information Assurance and Security (JIAS)*, 2009, Vol. 4, No. 3, pp. 247-255. [CCR]

B. E. Mullins, J. R. Seyba, R. A. Raines, B. W. Ramsey and P. D. Williams, "Voice and Video Capacity of a Secure IEEE 802.11g Wireless Network," *Mobile Computing and Communications Review*, 2008, Vol. 13, No. 1, pp. 26-34. [CCR]

A. N. Phillips, B. E. Mullins, R. A. Raines, and R. O. Baldwin, "A Secure Group Communication Architecture for Autonomous Unmanned Aerial Vehicles," *Security and Communication Networks*, 2008, DOI: 10.1002/sec. 55, pp. 1-15. [CCR]

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

- S. Cooper, C. Nickell, V. Piotrowski, B. Oldfield, A. Abdallah, M. Bishop, B. Caelli, M. Dark, E. K. Hawthorne, L. Hoffman, L. Perez, C. Pfleeger, R. Raines, and C. Schou, "Information Assurance Education Guidelines and Standards," *Proceedings of the 2009 ACM SIGCSE Annual Conference on Innovation & Technology in Computer Science Education*, Paris France, July 2009. [CCR]
- D. J. Kelly, R. A. Raines, R. O. Baldwin, B. E. Mullins, and M. R. Grimaila, "Towards a Taxonomy of Wired and Wireless Anonymous Networks," *IEEE International Communications Conference 2009*, Dresden Germany, 14-18 June 2009, 35% acceptance rate. [CCR]
- B. D. Birrer, R. A. Raines, R. O. Baldwin, M. Oxley, and S. K. Rogers, "Using Qualia and Multi-Layered Relationships in Malware Detection," *2009 IEEE Symposium on Computational Intelligence in Cyber Security (CICS 2009)*, Nashville, TN, March 2009, pp. 1-6. [CCR]
- D. J. Kelly, R. A. Raines, R. O. Baldwin, B. E. Mullins, and M. R. Grimaila, "Towards a Tree-based Taxonomy of Anonymous Networks," *IEEE Consumer Communications & Networking Conference*, Las Vegas NV, 14 January 2009, pp. 1-2. [CCR]
- D. J. Kelly, R. A. Raines, R. O. Baldwin, B. E. Mullins, and M. R. Grimaila, "Towards Mathematically Modeling the Anonymity Reasoning Ability of an Adversary," *27<sup>th</sup> IEEE International Performance Computing and Communications Conference/Workshop on Information and Data Assurance*, Austin TX, December 2008, pp. 524-531. [CCR]
- D. J. Kelly, R. A. Raines, R. O. Baldwin, B. E. Mullins, and M. R. Grimaila, "A Survey of State-of-the-Art in Anonymity Metrics," *First ACM Workshop on Network Data Anonymization (NDA 2008)* in association with the *Fifteenth ACM Conference on Computer and Communications Security*, Alexandria VA, October 2008, pp. 1-5 (CD). [CCR]

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

- B. D. Birrer, R. A. Raines, R. O. Baldwin, M. Oxley, and S. K. Rogers, "Using Qualia and Novel Representations in Malware Detection," *2009 SPIE Defense Security and Sensing Conference*, Orlando FL, 13-17 April 2009, pp. 1-6. [CCR]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

- T. McDonald, B. Peterson, D. Karrels, T. Andel, and R. Raines, "Guarding the Cybercastle in 2020," *IAnewsletter*, Information Assurance Technical Analysis Center, Vol. 11, No 3, Fall 2008, pp. 4-13.
- Member, Committee on National Systems Security Education, Training, and Awareness Working Group.
- Member, National Information Assurance Education Working Group.
- Member, Scientific and Technical Advisory Council, Cyberspace Innovation Center (CIC) Louisiana.
- Member, U.S. Government Interagency Coordinating Committee, elected to represent 30 NSF SFS institutions 2008-2010.
- "Malware Research at the Air Force Institute of Technology," presented at the AFRL Malware Technical Exchange Meeting, Kirtland AFB, NM, September 2009.
- "Building Cyberspace Education into Professional Military Education," presented at the DoD Transformation Network Meeting, West Point NY, September 2009.



“Center for Cyberspace Research,” presented to NRO (Dr. Teeple), Wright Patterson AFB OH, 30 April 2009.

“Cyberspace Research—SCADA Systems,” presented to AU/FM, Wright Patterson AFB OH, 28 April 2009.

“Cyberspace Warrior Development at the Air Force Institute of Technology,” video interview, *Pentagon Channel*, February 2009.

“Center for Cyberspace Research,” presented to NASA (Mr. Stringer), NASA Glenn, Cleveland OH, 4 February 2009.

#### **RAQUET, JOHN F.,**

Associate 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, navigation 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. Tel. 937-255-3636 x4580 (DSN 785-3636 x4580), email: [John.Raquet@afit.edu](mailto:John.Raquet@afit.edu)

#### **SPONSOR FUNDED RESEARCH PROJECTS**

"ANT Center and Laboratory Support per Appendix of the MOA between AFIT and AFRL." Sponsor: AFRL/RV. Funding: \$200,000. [ANT]

"Development of High Accuracy TSPI Systems." Sponsor: 746 TSS/XPR. Funding: 45,900. [ANT]

"GNSS Software Receiver Research." Sponsor: AFSPC GPS Wing. Funding: \$75,000. [ANT]

"Navigation Systems Integration." Sponsor: SSC PACIFIC. Funding: \$10,000. [ANT]

"Non-GPS Navigation Using Radio-Based Ranging Combined with Additional Sensors." Sponsor: Raytheon. Funding: \$100,000. [ANT]

"Support for RSN and SSN Programs." Sponsor: DARPA. Funding: \$20,035. [ANT]

#### **REFEREED JOURNAL PUBLICATIONS**

R. K. Martin, J. S. Velotta, and J. F. Raquet, "Bandwidth Efficient Cooperative TDOA Computation for Multicarrier Signals of Opportunity," IEEE Trans. on Signal Processing, vol. 57, no. 6, June 2009, pp. 2311-2322. [ANT]

#### **REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW**

Morrison, J., J. Raquet, and M. Veth, "Performance Evaluation of Vision Aided Inertial Navigation System Augmented with a Coded Aperture," Proceedings of ION International Technical Meeting, Anaheim, CA, January 2009. [ANT]

Crosby, J., R. K. Martin, J. Raquet, and M. Veth, "Fusion of Inertial Sensors and Signals of Opportunity for Unassisted Navigation," in Proc. NAV08/ILA37: The Navigation Conference & Exhibition, London, UK, October 2008. [ANT]

**SAVILLE, MICHAEL A., Maj,**

Assistant Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT  
Appointment Date: 2006 (AFIT/ENG), BSEE, Texas A&M University, 1997; MSEE, Air Force Institute of Technology, 2000; PhD, University of Illinois at Urbana-Champaign, 2006. His research interests include synthetic aperture radar (SAR) imaging and inverse problems, radar signal processing, electromagnetic radiation and scattering phenomenology, computational electromagnetics, and electromagnetic theory. Tel. 937-255-3636 x4719 (DSN 785-3636 x4719), email: [Michael.Saville@afit.edu](mailto:Michael.Saville@afit.edu)

**SPONSOR FUNDED RESEARCH PROJECTS**

“Multi-objective Optimization Algorithm for Future Radar Systems.” Sponsor: AFRL/RY. Funding: \$80,000.

“Technical Support: GOTCHA System.” Sponsor: AFRL/RY. Funding: \$25,000.

**REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW**

D. F. Fuller, M. A. Saville, A. J. Terzuoli, P. J. Collins, “Rapid Extraction of Doubly-Curved Scattering Centers for Automobile Detection in the Presence of Clutter,” *Proceedings 2009 IEEE Radar Conference*, Pasadena, CA, May 2009.

**REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW**

D. F. Fuller and M. A. Saville, “The Spectrum Parted Linked Image Test (SPLIT) Algorithm for Estimating the Frequency Dependence of Scattering Center Amplitudes,” *Proc. of the SPIE, Algorithms for Synthetic Aperture Radar Imagery XVI*, Orlando, FL, 16-17 April 2009, pp. 73370L-1 to 73370L-10.

**OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES**

Invited Talk: M. A. Saville and D. E. Hack, "Investigation of OFDM-based Interference in the Radar Environment," Spectrum Management Workshop, Tri-Service Radar Symposium, Boulder, CO, 22-26 June 2009.

**SCHMIDT, JASON D., Maj,**

Assistant Professor of Electro-Optics, Department of Electrical and Computer Engineering, AFIT,  
Appointment Date: 2006 (AFIT/ENG), BS in Physics, Marquette University 1998; MS in Physics 2000, The Ohio State University; PhD in Electro-Optics 2006, University of Dayton. His research interests include optical effects of atmospheric turbulence, adaptive optics, free-space optical communications, laser weapons, and optical modeling. He is a member of SPIE, OSA, and DEPS. Tel. 937-255-3636 x7224 (DSN 785-3636 x7224), e-mail: [Jason.Schmidt@afit.edu](mailto:Jason.Schmidt@afit.edu)

**SPONSOR FUNDED RESEARCH PROJECTS**

“Advanced Wavefront Estimation in Strong Turbulence.” Sponsor: AFOSR. Funding: \$97,256. [CDE]

“Advanced Wavefront Sensing and Control.” Sponsor: AFRL/RD. Funding: \$30,000. [CDE]

**REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW**

Ellis, T. R. and Schmidt, J. D., “Hybrid Wavefront Sensor for Strong Turbulence,” *OSA Frontiers in Optics*, FMF2, Rochester, NY, October 2008. [CDE]

Monz, A. B. and Schmidt, J. D., “A Maximum Likelihood Estimator for Tracking Purposes with Extended Sources,” *IEEE Aerospace Conference*, 1568, Big Sky, MT, March 2009. [CDE]

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Schmidt, J. D. and Louthain, J. A. "Integrated Approach to Free-Space Optical Communication," [Invited Paper] Atmospheric Propagation of Electromagnetic Waves. *Proc. SPIE*. Vol. 7200, 7200I, San Jose, CA, January 2009. [CDE]

Ellis, T. R. and Schmidt, J. D., "Photon-Noise-Limited Performance for a Hybrid Wavefront Sensor Operating in Strong Turbulence," *Proc. SPIE*. Vol. 7466, 746603, San Diego, CA, August 2009. [CDE]

Corej, T. A. and Schmidt, J. D., "Impact of Resolution in Multi-Conjugate Adaptive Optics Using Segmented Mirrors," *Proc. SPIE*. Vol. 7466, 74660B, San Diego, CA, August 2009. [CDE]

Perez, J. J., Toussaint, G. J., and Schmidt, J. D., "Adaptive Control of Woofer-Tweeter Adaptive Optics," *Proc. SPIE*. Vol. 7466, 74660B, San Diego, CA, August 2009. [CDE]

Engstrom, N. D. and Schmidt, J. D., "Misregistration in Adaptive Optics Systems," *Proc. SPIE*. Vol. 7466, 74660A, San Diego, CA, August 2009. [CDE]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Invited Talk: Schmidt, J. D. and Louthain, J. A. "Integrated Approach to Free-Space Optical Communication," Atmospheric Propagation of Electromagnetic Waves. *Proc. SPIE*, Vol. 7200, 7200I, San Jose, CA, January 2009. [CDE]

Session Chair for 2009 IEEE Aerospace Conference, session 5.02: Novel Imaging Systems.

Session chair and program committee for 2009 SPIE Optics & Photonics Conference, session on Advanced Wavefront Control: Methods, Devices, and Applications VII.

Reviewed article submissions for Optics Express.

Reviewed book application submission for SPIE Press.

#### **SILVIUS, MARK D., Maj,**

Assistant Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT  
Appointment Date: 2009 (AFIT/ENG), BS, Cornell University, 1999; MS, Syracuse University, 2003; PhD, Virginia Polytechnic Institute and State University, 2009. His research interests are wireless communications and cognitive radio. Tel. 937-255-3636 x4684 (DSN 785-3636 x4684), e-mail: [Mark.Silvius@afit.edu](mailto:Mark.Silvius@afit.edu)

#### **STARMAN, LaVERN A., Maj,**

Assistant Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT  
Appointment Date: 2005 (AFIT/ENG): BSEE, University of Nebraska, Lincoln, 1994, MSEE, Wright State University, 1997; PhD, Air Force Institute of Technology, 2002. His areas of expertise include the design and fabrication of micro-electro-mechanical systems (MEMS), microelectronics and nanotechnology. He is a member of IEEE, Eta Kappa Nu, Sigma Xi and Tau Beta Pi. Tel. 937-255-3636 x4618 (DSN 785-3636 x4618), email: [LaVern.Starman@afit.edu](mailto:LaVern.Starman@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

"RF/Optical/Thermal Metamaterials Research." Sponsor: AFRL/RX. Funding: \$30,000.

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Coutu Jr., R.A., McBride, J.W., and Starman, L.A., "Improved Micro-Contact Resistance Model that Considers Material Deformation, Electron Transport, Thin Film Characteristics, and the Casimir Effect," Paper No. 85, *IEEE Holm Conference on Electrical Contacts*, 14-16 September 2009.

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Stackhouse, M, Starman, L.A., and Coutu, Jr., R.A., "MEMS-based Anti-tamper Technologies," *USA RDECOM Workshop on Research and Evaluation of NEMS/MEMS*, Redstone Arsenal, AL, 8-9 September 2009.

Rederus, L., M, Starman, L.A., Coutu, Jr., R.A., and Collins, P.J., "MEMS-tunable RF Metamaterials," *USA RDECOM Workshop on Research and Evaluation of NEMS/MEMS*, Redstone Arsenal, AL, 8-9 September 2009.

Lake, R., Starman, L.A., and Coutu, Jr., R.A., "MEMS Safe and Arm device," *USA RDECOM Workshop on Research and Evaluation of NEMS/MEMS*, Redstone Arsenal, AL, 8-9 September 2009.

Smith, N., Coutu, Jr., R.A., and Starman, L.A., "MEMS-based Preconcentrator for Chem/Bio Sensors," *USA RDECOM Workshop on Research and Evaluation of NEMS/MEMS*, Redstone Arsenal, AL, 8-9 September 2009.

Roman, C., Starman, L.A., and Coutu, Jr., R.A., "Thermal Metamaterials," *USA RDECOM Workshop on Research and Evaluation of NEMS/MEMS*, Redstone Arsenal, AL, 8-9 September 2009.

Kossler, M., Crossley B.L., Coutu Jr., R.A., and Starman, L.A., and Collins, P.J., "Study on the Effects of Hydrogen Pretreatment on Nickel Catalyst used for Multi-Walled Carbon Nanotube Growth," *Proceeding of SPIE Vol. 7399-03*, August 2009.

Laurvick, T., Starman, L.A., and Coutu Jr., R.A., "Chip-to-Chip Optical Interconnection using MEMS Mirrors," *Proceeding of SPIE Vol. 7468A-15*, August 2009.

Langley D., Coutu Jr., R.A., and Starman, L.A., "Optical Metamaterials for Photonics Applications," *Proceeding of SPIE Vol. 7468A-16*, August 2009.

Lagoski, T.J., Coutu Jr., R.A., and Starman, L.A., "Optimized Retroreflector for Photonic Doppler Velocimetry," *Proceeding of SPIE Vol. 7468A-17*, August 2009.

Ledet, M.M., Starman, L.A., Coutu Jr., R.A., and Rogers, S., "Utilizing Micro-Electro-Mechanical Systems (MEMS) Micro-Shutter Designs for Adaptive Coded Aperture Imaging (ACAI) Technologies," *Proceeding of SPIE Vol. 7468A-18*, August 2009.

Porter, Roy, Stone, Samuel J., Kim, Yong C., McDonald, Todd, and Starman, LaVern A., "Dynamic Polymorphic Reconfiguration for Anti-Tamper Circuits," *IEEE International Conference on Field Programmable Logic and Applications (FPL 09)*, Prague, Czech Republic, August 2009.

Patel, Hiren, Kim, Yong, McDonald, Todd, J., and Starman, LaVern A., "Increasing Stability and Distinguishability of the Digital fingerprint in FPGAs Through Input Word Analysis," *IEEE International Conference on Field Programmable Logic and Applications (FPL 09)*, Prague, Czech Republic, August 2009.

S. Ganguli, A. Roy, R. Wheeler, and L. Starman, "Steady State Thermal Conductivity Measurement at Microscale," *International Conference on Composite Materials (ICCM-17)*, Edinburgh, UK, 27-31 July 2009.

Starman, L.A. and Coutu Jr., R.A., "Residual Stress Monitoring of Post-Processed MEMS Fixed-Fixed Beams," *Proceedings of the 10<sup>th</sup> International Symposium on MEMS and Nanotechnology*, pp. 18-27, June 2009.

Coleman, N.R., Starman, L.A., and Coutu Jr., R.A., "Residual Stress for Assembling, Partially Assembling and Actuating MEMS Devices," *Proceedings of the 10<sup>th</sup> International Symposium on MEMS and Nanotechnology*, pp. 106-113, June 2009.

Langley, D., Starman, L.A., Coutu Jr., R.A., and Rogers, S., "Thermally-actuated Micro-shutter for MOEMS Applications," *Proceedings of SPIE Vol. 7208-7*, 2009 – Paper recommended for publication in *Journal of Micro/Nanolithography, MEMS, and MOEMS (JM3)*.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Chabak, K., Starman L.A., Coutu, Jr., R.A., "Conceptual Study of Rotary-Wing Microrobotics," presented at the 34<sup>th</sup> Annual Dayton-Cincinnati Aerospace Science Symposium, Dayton, OH, 3 March 2009.

Coleman, N., Starman, L.A., and Coutu Jr., R.A., "Micro-Scale Flapping Wings," presented at the 34<sup>th</sup> Annual Dayton-Cincinnati Aerospace Science Symposium, Dayton, OH, 3 March 2009.

#### **STEPANIAK, MICHAEL J., Lt Col,**

Assistant Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2009 (AFIT/ENG); BSEE, Carnegie Mellon University, 1994; MSEE, Air Force Institute of Technology, 1995; PhD in Electrical Engineering, Ohio University, 2008. His research interests include laser-aided navigation, stochastic estimation, and control theory. He is a member of Tau Beta Pi, Eta Kappa Nu, and Phi Kappa Phi. Tel. 937-255-3636 x4603 (DSN 785-3636 x4603), email:

[Michael.Stepaniak@afit.edu](mailto:Michael.Stepaniak@afit.edu)

#### REFEREED JOURNAL PUBLICATIONS

Stepaniak, M. J., Uijt de Haag, M., and van Graas, F., "Field Programmable Gate Array-Based Attitude Stabilization," *AIAA Journal of Aerospace Computing, Information, and Communication*, Vol. 6, No. 7, pp. 451-463, July 2009.

Stepaniak, M. J., van Graas, F., and Uijt de Haag, M., "Design of an Electric Propulsion System for a Quadrotor Unmanned Aerial Vehicle," *AIAA Journal of Aircraft*, Vol. 46, No. 3, pp. 1050-1058, May-June 2009.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Vice-chairman, Dayton Chapter of the Institute of Navigation.

Secretary and founding officer, Wright Chapter of the Society of Flight Test Engineers.

#### **TEMPLE, MICHAEL A.,**

Professor of Electrical Engineering, AFIT Appointment Date: 1996 (AFIT/ENG). Earned degrees include a BSE (1985) and MSE (1986) from Southern Illinois University, Edwardsville, and a Ph.D. (1993) from AFIT. Actively supports AFIT's Center for Cyberspace Research (CCR), with recent contributions made in the areas of Spectrally Modulated, Spectrally Encoded (SMSE) waveform design and wireless security through RF Distinct Native Attribute (RF-DNA) fingerprinting. His sponsored research efforts in Command, Control, Communications and Intelligence (C3I), radar signal/signature processing, and Electronic Warfare (EW), as adopted by and/or transitioned to DoD and other national agencies, has provided nearly \$2M in research and technology benefit. Dr. Temple is a member of Eta Kappa Nu, Tau Beta Pi and a senior member of IEEE. Tel. 937-255-3636 x4279 (DSN 785-6565 x4279), email: [Michael.Temple@afit.edu](mailto:Michael.Temple@afit.edu)

### SPONSOR FUNDED RESEARCH PROJECTS

"Technical Support: Opportunistic Channel Assessment." Sponsor: Laboratory for Telecommunications Sciences. Funding: \$50,000. [CCR]

"Phase II Support: RF-EW Systems." Sponsor: AFRL/R.Y. Funding: \$80,000.

### REFEREED JOURNAL PUBLICATIONS

Suski, W.C., Temple, M.A., Mendenhall, M.J., and Mills, R.F., "Radio Frequency Fingerprinting Commercial Communication Devices to Enhance Electronic Security," *Int'l Journal of Electronic Security and Digital Forensics* (IJESDF), 11:3:301-322, October 2008.

### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Like, E.C. and Temple, M.A., "Coexistent Intra-Symbol SMSE Waveform Design: Variation in Waveform Update Latency and Update Rate," *4<sup>th</sup> Int'l Conf on CR Oriented Wireless Networks and Communications* (CROWNCOM09), Hannover, Germany, June 2009.

Chakravarthy, V., Xie, L., Zhou, R., Wu, Z., and Temple, M.A., "A Novel Hybrid Overlay/Underlay CR Waveform in Freq Selective Fading Channels," *4<sup>th</sup> Int'l Conf on CR Oriented Wireless Networks and Communications* (CROWNCOM09), Hannover, Germany, June 2009.

Klein, R.W., Temple, M.A., Mendenhall, M.J. and Reising, D.R., "Sensitivity Analysis of Burst Detection and RF Fingerprinting Classification Perf," *2009 IEEE Int'l Conf on Comm* (ICC09), Dresden, Germany, June 2009.

Like, E.C., Temple M.A., and Gustafson, "Intra-Symbol SMSE Waveform Design Amidst Coexistent Primary Users," *2009 IEEE Int'l Conf on Comm* (ICC09), Dresden, Germany, June 2009.

L. Xie, L., Like E.C., Wu, Z., Temple, M.A., "Performance of MC-CDMA and CI/MC-CDMA Systems in the Presence of Narrowband Interference," *5<sup>th</sup> Int'l Wireless Comm and Mobile Computing Conf* (IWCMC09), Leipzig, Germany, June 2009.

Like, E.C., Temple, M.A., and Gustafson, S.C., "Intra-Symbol SMSE Waveform Design Amidst Coexistent 802.11 OFDM Signals," *4<sup>th</sup> Int'l Waveform Diversity and Design Conference* (WDD09), Orlando, FL, February 2009.

Beard, T.W., Temple, M.A., Raquet, J.F, Mills, R.F, and Miller, J.O., "A Hybrid GA-RSM Optimization Process for Coexistent SMSE Waveform Design," *4<sup>th</sup> Int'l Waveform Diversity and Design Conference* (WDD09), Orlando, FL, February 2009.

Suski, W.C., Temple, M.A., Mendenhall, M.J, and Mills, R.F., "Using Spectral Fingerprints to Improve Wireless Network Security," *2008 IEEE Global Communications Conference* (GLOBECOM08), December 2008.

Hopp, S.J., Temple, M.A., Mullins, B.E. and Baldwin, R.O., "Coexistent Performance Characterization of a Simulated GMSK System Using Operational Parameters," *2008 Military Communications Conf* (MILCOM08), San Diego, CA, November 2008.

Kaun, M.D., Temple, M.A., Mills, R.F. and Mendenhall, M.J., "Exploiting the Electromagnetic Environment (EME) Using Entropy-Based Time-Frequency Techniques," *2008 Military Communications Conf* (MILCOM08), San Diego, CA, November 2008.

- R. Lidowski, B. Mullins, R. Baldwin, and M. Temple, "A Novel Communications Protocol Using Geographic Routing for Swarming UAVs Performing a Search Mission," *Seventh IEEE International Conference on Pervasive Computing and Communications*, March 2009, pp. 162-168.
- S. Hopp, M. Temple, B. Mullins, and R. Baldwin, "Coexistent Performance Characterization of a Simulated GMSK System Using Operational Parameters," *2008 IEEE Military Communications Conference (MILCOM 2008)*, November 2008, pp. C4.1-1.1-6.
- E. Like, M. Temple, and S. Gustafson, "Adaptive Intra-symbol SMSE Waveform Design Amidst Coexistent Primary Users," *IEEE International Conference on Communication*, June 2009.
- R. Klein, M. Temple, and M. Mendenhall, "Sensitivity Analysis of Burst Detection and RF Fingerprinting Classification Perf," *2009 IEEE International Conference on Communications (ICC 2009)*, June 2009.
- W. Suski, M. Temple, M. Mendenhall, and R. Mills, "Using Spectral Fingerprints to Improve Wireless Network Security," *2008 IEEE Global Communications Conference (GLOBECOM 2008)*, December 2008.
- M. Kaun, M. Temple, R. Mills, and M. Mendenhall, "Exploiting the Electromagnetic Environment (EME) Using Entropy-Based Time-Frequency Techniques," *2008 Military Communications Conference (MILCOM 2008)*, November 2008.
- V. Chakravarthy, Z. Wu, M. Temple, and A. Shaw, "Novel Overlay/Underlay CR Waveforms Using an SD-SMSE Framework to Enhance Spectrum Efficiency – Part I," *IEEE Trans on Comm*, September 2009.
- E. Like and M. Temple, "Coexistent Intra-Symbol SMSE Waveform Design: Variation in Waveform Update Latency and Update Rate," *4th Int'l Conf on CR Oriented Wireless Networks and Communications (CROWNCOM)*, June 2009.
- V. Chakravarthy, Z. Wu, and M. Temple, "A Novel Hybrid Overlay/Underlay CR Waveform in Freq Selective Fading Channels," *4th Int'l Conf on CR Oriented Wireless Networks and Communications (CROWNCOM)*, June 2009.
- Xie, L., Like, E., Z. Wu, and M. Temple, "Performance of MC-CDMA and CI/MC-CDMA Systems in the Presence of Narrowband Interference," *5th Int'l Wireless Comm and Mobile Computing Conf (IWCMC09)*, June 2009.
- E. Like, M. Temple, and S. Gustafson, "Intra-Symbol SMSE Waveform Design Amidst Coexistent 802.11 OFDM Signals," *4th Int'l Waveform Diversity and Design Conference (WDD09)*, February 2009.
- T. Beard, M. Temple, J. Raquet, and R. Mills, "A Hybrid GA-RSM Optimization Process for Coexistent SMSE Waveform Design," *4th Int'l Waveform Diversity and Design Conference (WDD09)*, February 2009.

**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. His 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;  
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  
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**SPONSOR FUNDED RESEARCH PROJECTS**

"Improving Stand-Off Target Identification with Low Resolution Synthetic Aperture Radar." Sponsor:  
AFRL/RY. Funding: \$50,000.

"Persistent Sensor Enhancement." Sponsor: AFRL/RY. Funding: \$30,000.

"Remote Sensing and Communications for Advanced Technical Exploitation." Sponsor: NASIC. Funding:  
\$125,000.

**BOOKS AND CHAPTERS IN BOOKS**

P. Ya. Ufimtsev; A. J. Terzuoli, Jr., (ed.), R. D. Moore (trans.), "Theory of Diffraction in Electromagnetics,"  
(revised ed.) Raleigh, NC, Scitech Publishing, 2009, ISBN: 9781891121661.

**OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES**

Chair for Local Chapter Joint IEEE Societies APS, MTT, GRS.

Member of AFIT-AFRL-NASIC Passive Radar Working Group (PCR WG).

Member of DoD Over the Horizon Radar Working Group (OTHR WG).

Member of WPAFB Reconnaissance Steering Group (RSG).

Steering committee Member, Joint AFIT-AFRL-NASIC Wright-Patterson MASINT Development  
Consortium (WPMDC).

Participant in Dayton Development Coalition (DDC) Sensors Task Force.

Participant in DDC Science, Technology, Engineering, and Math (STEM) Education Summit.

**THOMAS, RYAN W., Maj,**

Assistant Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT  
Appointment Date: 2007 (AFIT/ENG); BS, Engineering, Harvey Mudd College, 1999; MSCE, Air Force  
Institute of Technology, 2001; PhD, Computer Engineering, Virginia Tech, 2007. His research interests  
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#### SPONSOR FUNDED RESEARCH PROJECTS

"Balancing Network and Mission Goals: A Cognitive Network Approach." Sponsor: AFOSR. Funding: \$36,540.

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Wabiszewski, Michael, Andel, Todd, Mullins, Barry, and Thomas, Ryan W., "Enhancing Realistic Hands-on Network Training in a Virtual Environment," in *Proceedings of Military Modeling and Simulation Symposium 2009*, San Diego CA, 22-27 March 2009.

Santos, Lady N. P., Mullins, Barry E, Baldwin, Rusty O., and Thomas, Ryan W., "VoIP Over MANETS: A Performance Analysis of OLSR," in *Proceedings of ICIW 2009*, 26-27 March 2009.

Ramsey, Benjamin W., Mullins, Barry E., Thomas, Ryan W., and Andel, Todd R., "Subjective Audio Quality Over Secure IEEE 802.11 Wireless Local Area Networks," in *Proceedings of IEEE IPCCC 2008*, December 2008.

Belue, John M., Kurkowski, Stuart H., Graham, Scott R., Hopkinson, Kenneth M., Thomas, Ryan W., and Abernathy, Joshua W., "Research and Analysis of Simulation-based Networks Through Multi-Objective Visualization," in *Proceedings of Winter Simulation Conference 2008*, December 2008.

Thomas, Ryan W. and Borghetti, Brett C., "Information Assurance Implications for Software Defined Radio, Cognitive Radio and Cognitive Networks," *IA Newsletter*, February 2009.

#### BOOKS AND CHAPTERS IN BOOKS

Thomas, Ryan W. and DaSilva, Luiz A., "Cognitive Networking," in *Cognitive Radio Technology*, 2<sup>nd</sup> Edition, B. Fette, ed. Academic Press, 2008.

DaSilva, Luiz A. and Thomas, Ryan W., "Rendezvous in Cognitive Radio Networks," in *Cognitive Radio Technology*, 2<sup>nd</sup> Edition, B. Fette, ed. Academic Press, 2008.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

INL Wireless Steering Committee, invited committee member, September 2009, consultation.

Technical Program Committee Member: IEEE ICC 2010, IEEE CROWNCOM 2009, IEEE MASS 2009, consultation.

NSF Panel Member, May 2009, consultation.

#### **TOUSSAINT, GREGORY J., Lt Col,**

Deputy Department Head and Assistant Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2007 (AFIT/ENG); BS Electrical Engineering, Cornell University, 1989; MS Systems Engineering, Air Force Institute of Technology, 1992; PhD, University of Illinois at Urbana-Champaign, 2000. His research interests include control theory, nonlinear systems, tracking, and estimation. Tel. 937-255-3636 x7257 (DSN 785-3636 x7257), e-mail: [Gregory.Toussaint@afit.edu](mailto:Gregory.Toussaint@afit.edu)

#### REFEREED JOURNAL PUBLICATIONS

R. Thomas, A. Rosa, and G. Toussaint, "The Analysis and Design of Linear Circuits," *John Wiley & Sons, Inc.*, Hoboken, NJ, 2009, 6th ed., p. 950.

J. Perez, G. Toussaint, and J. Schmidt, "Adaptive Control of Woofer-Tweeter Adaptive Optics," *Advanced Wavefront Control: Methods, Devices, and Applications VII. SPIE #7466-10*, August 2009.

D. Pack and G. Toussaint, "Cooperative Control of UAVs for Localization of Intermittently Emitting Mobile Targets," *IEEE Transactions on Systems, Man, and Cybernetics-Part B*, August 2009, Vol 39, pp. 959-970.

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

S. Groves and G. Toussaint, "Predictive Control Using a Priori Effective Wind Velocities in an Adaptive Optics System," *2009 Beam Control Conference*, April 2009.

#### **TRIAS, ERIC D., Maj,**

Assistant Professor of Computer Science, Department of Electrical and Computer Engineering, AFIT  
Appointment Date: 2008 (AFIT/ENG), BSCS, University of California, Davis, 1998; MSCE, Air Force Institute of Technology, 2002; PhD, Computer Science, University of New Mexico, 2008. His research interests include database systems, information hiding, knowledge discovery and data mining, and digital forensics. Tel. 937-255-3636 x4611 (DSN 785-3636 x4611), email: [Eric.Trias@afit.edu](mailto:Eric.Trias@afit.edu)

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

E. Trias, "Negative Ternary Set-Sharing," *24th International Conference on Logical Programming*, December 2008.

J. McDonald, E. Trias, and A. Lin, "Analyzing Functional Entropy of Software-Based Intent Protection Schemes," *4th International Conference on Information Warfare and Security*, March 2009.

E. Trias, J. Navas, E. Ackley, S. Forrest, and M. Hermenegildo, "Ternary Set-Sharing Analysis," *24th International Conference on Logic Programming (ICLP)*, December 2008.

#### **VETH, MICHAEL J., Lt Col,**

Assistant Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT  
Appointment Date: 2006 (AFIT/ENG), BSEE, Purdue University, 1993; MSEE, Air Force Institute of Technology, 1994; PhD, Air Force Institute of Technology, 2006. His research interests include image-aided navigation, cooperative targeting and navigation, and bio-inspired systems. Tel. 937-255-3636 x7228 (DSN 785-3636 x4551), email: [Michael.Veth@afit.edu](mailto:Michael.Veth@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

"Next Generation Navigation Reference System." Sponsor: AFMC. Funding: \$89,030. [ANT]

#### REFEREED JOURNAL PUBLICATIONS

"A Comparison of Two Image and Inertial Sensor Fusion Techniques for Navigation in Unmapped Environments," Taylor, C.N., Veth, M.J., Raquet, J.F., Miller, M.M., *IEEE Transactions on Aerospace and Electronic Systems*. [ANT]

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

"LQG Control Design for a Hovering Micro Air Vehicle using an Optical Tracking System," Hendrix, C.D., Veth, M.J., Carr, R.W., *IEEE Aerospace Conference*, Big Sky, MT, 2009. [ANT]

"Image-Based Relative Navigation for the Autonomous Refueling Problem Using Predictive Rendering," Weaver, A.D., Veth, M.J., *IEEE Aerospace Conference*, Big Sky, MT, 2009. [ANT]

### **5.3. DEPARTMENT OF ENGINEERING PHYSICS**

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<b>5.3.1</b>	<b><u>DOCTORAL DISSERTATIONS</u></b>	<b>110</b>
<b>5.3.2</b>	<b><u>MASTER'S THESES</u></b>	<b>110</b>
<b>5.3.3</b>	<b><u>FACULTY RESEARCH OUTPUT</u></b>	<b>112</b>

### 5.3.1. DOCTORAL DISSERTATIONS

GARVIN, MATTHEW B., *The Effective Potential Energy Surfaces of the Nonadiabatic Collision*. AFIT/DS/ENP/09-J01. Faculty Advisor: Dr. David E. Weeks. Sponsor: AFOSR.

STOIK, CHRISTOPHER D., *Nondestructive Evaluation of Aircraft Composites Using Terahertz Time Domain Spectroscopy*. AFIT/DS/ENP/09-D02. Faculty Advisor: Lt Col Matthew J. Bohn. Sponsor: AFRL/RX.

### 5.3.2. MASTER'S THESES

BACON, JEFFREY B., *Thermal Inactivation of Bacillus anthracis Using Laser Irradiation of Micro-Etched Platforms*. AFIT/GWM/ENP/09-M01. Faculty Advisor: Dr. Larry Burggraf. Sponsor: AFMC/CX.

BALLING, BRADLEY, *A Comparative Study of the Bidirectional Reflectance Distribution Function of Several Surfaces as a Mid-wave Infrared Diffuse Reflectance Standard*. AFIT/GE/ENP/09-M01. Faculty Advisor: Dr. Michael Marciniak. Sponsor: AFRL/RX.

BELL, LATOSHA M., *Effect of Advanced Synthetically Enhanced Detector Resolution Algorithm on Specificity and Sensitivity of Portable High Purity Germanium Gamma Detector Spectra*. AFIT/GNE/ENP/09-J01. Faculty Advisor: Dr. James C. Petrosky. Sponsor: DTRA.

BETZ, JEREMIAH N., *Production of Recombinant Injectosome and Outer Membrane Proteins from Yersinia Pestis KIM5*. AFIT/GWM/ENP/09-S01. Faculty Advisor: Lt Col David A Smith. Sponsor: 711 HPW/RH.

BOWEN, SPENCER J., *Hyperspectral Imaging of a Turbine Engine Exhaust Plume to Determine Radiance, Temperature, and Concentration Spatial Distributions*. AFIT/GAP/ENP/09-M02. Faculty Advisor: Dr. Michael Marciniak. Sponsor: AFRL/RX.

COHEN, J. JEAN, *Demonstration and Verification of a Broad Spectrum Anomalous Dispersion Effects Tool for Index of Refraction and Optical Turbulence Calculations*. AFIT/GAP/ENP/09-M03. Faculty Advisor: Lt Col Steven T. Fiorino. Sponsor: HEL-JTO.

DEXTER, MICHAEL L., *Production and Characterization of High Repetition Rate Terahertz Radiation in Femtosecond-Laser-Induced Air Plasma*. AFIT/GAP/ENP/09-M04. Faculty Advisor: Lt Col Matthew J. Bohn. Sponsor: N/A.

ECHEVERRIA, FRANCESCO J., *Assessment of Weather Sensitivites and Air Force Weather (AFW) Support to Tactical Lasers in the Lower Troposphere*. AFIT/GAP/ENP/09-M05. Faculty Advisor: Lt Col Steven T. Fiorino. Sponsor: AFWA.

GOMEZ, TRAVIS C., *Investigation of Electrical and Optical Properties of Bulk III-V Ternary Semiconductors*. AFIT/GMS/ENP/09-M01. Faculty Advisor: Dr. Yung Kee Yeo. Sponsor: AFOSR.

JOHNSON, JEREMY D., *Non-Destructive Evaluation of Aerospace Composites*. AFIT/GMS/ENP/09-M02. Faculty Advisor: Lt Col Matthew J. Bohn. Sponsor: AFRL/RX.

KEARNS, CHRISTINA R., *In Vitro Toxicity of Silver Nanoparticles in Human Lung Epithelial Cells*. AFIT/GWM/ENP/09-M02. Faculty Advisor: Lt Col David A. Smith. Sponsor: 711 HPW/RH.

KOEHL, MICHAEL A., *Thermal Flash Simulator*. AFIT/GNE/ENP/09-M04. Faculty Advisor: Dr. Larry Burggraf. Sponsor: DTRA

LACY, BRENT R., *A Wigner Distribution Analysis of One Dimensional Scattering*. AFIT/GAP/ENP/09-M06. Faculty Advisor: Dr. David E. Weeks. Sponsor: AFOSR.

LAMOTT, ROBERT B., *Analysis and Application of the Bi-directional Scatter Distribution Function of Photonic Crystals*. AFIT/GEO/ENP/09-M01. Faculty Advisor: Dr. Michael A. Marciniak. Sponsor: N/A.

LEWIS II, CHARLTON D., *Theoretical Model Analysis of Absorption of a Three Level Diode Pumped Alkali Laser*. AFIT/GAP/ENP/09-M07. Faculty Advisor: Dr. Glen P. Perram. Sponsor: HEL-JTO.

MAREK, SETH L., *A Computational Tool for Evaluating THz Imaging Performance in Brownout Conditions at Land Sites Throughout the World*. AFIT/GAP/ENP/09-M08. Faculty Advisor: Lt Col Steven T. Fiorino. Sponsor: AFWA.

MATTEI, DANIEL I., *The Use of Spider Webs as Passive Bioaerosol Collectors*. AFIT/GWM/ENP/09-M03. Faculty Advisor: Dr. Charles Bleckmann. Sponsor: NASIC.

McGARY, JOSHUA D., *Electrostatic Discharge Properties of Irradiated Nanocomposites*. AFIT/GNE/ENP/09-M03. Faculty Advisor: Dr. James C. Petrosky. Sponsor: N/A.

MORAN, JEFFREY T., *The Effects of Temperature and Electron Radiation on the Electrical Properties of AlGaIn/GaN Heterostructure Field Effect Transistors*. AFIT/GNE/ENP/09-M04. Faculty Advisor: Lt Col John W. McClory. Sponsor: DTRA.

O'DAY, BUCKLEY E., *Estimation of Weapon Yield From Inversion of Dose Rate Contours*. AFIT/GNE/ENP/09-M05. Faculty Advisor: Lt Col Steven T. Fiorino. Sponsor: DTRA.

ROCKROHR, RANDALL L., *Determining SNM Source Position Using Gamma Spectra from a Portable High Purity Germanium Detector*. AFIT/GNE/ENP/09-M06. Faculty Advisor: Dr. Larry Burggraf. Sponsor: DTRA.

ROGERS, NEIL G., *Electron Multipactor: Theory Review, Comparison and Modeling of Mitigation Techniques in ICEPIC*. AFIT/GE/ENP/09-M02. Faculty Advisor: Dr. William F. Bailey. Sponsor: AFRL/RD.

SLAGLE, STEVEN E., *Advanced Radiometry for High Discrimination Explosive Fireball Discrimination*. AFIT/GEO/ENP/09-M02. Faculty Advisor: Dr. Kevin C. Gross. Sponsor: N/A.

SPAULDING, JONATHAN C., *Predicting Solar Protons: A Statistical Approach*. AFIT/GAP/ENP/09-M09. Faculty Advisor: Maj Ariel Acebal. Sponsor: N/A.

SWIFT, SETH M., *Q-Switched and Mode Locked Short Pulses from a Diode Pumped, Yb-Doped Fiber Laser*. AFIT/GAP/ENP/09-M10. Faculty Advisor: Lt Col Matthew J. Bohn. Sponsor: N/A.

TATAR, JOHN J., *Wave Optics Simulation of Optically Augmented Retroreflections for Monostatic/Bistatic Detection*. AFIT/GEO/ENP/09-M03. Faculty Advisor: Dr. Michael Marciniak. Sponsor: AFRL/RX.

VILLAFUERTE, JULIO, *Determining Source and Shielding of Suspected Special Nuclear Material Configurations Using a Portable High Purity Germanium Detector*. AFIT/GNE/ENP/09-J02. Faculty Advisor: Dr. James C. Petrosky. Sponsor: DTRA.

### 5.3.3. FACULTY RESEARCH OUTPUT

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

#### **ACEBAL, ARIEL O., Lt Col,**

Assistant Professor of Atmospheric Physics, Department of Engineering Physics, AFIT Appointment Date: 2008 (AFIT/ENP); BS, Florida State University, 1993; MS, Air Force Institute of Technology, 2000; PhD, Utah State University, 2008. Lt Col Acebal's research interests cover a range of topics under the broad umbrella of space physics. Recent work has focused primarily on solar radio emissions, with an emphasis on correlations with solar EUV emissions and ionospheric models. He is also interested in the transition of cutting edge research to operational forecast products. Previously he worked as the commander of the Palehua Solar Observatory and the branch chief for the Space Weather Branch at the Air Force Weather Agency. He is a member of the American Geophysical Union. Tel. 937-255-3636 x4518 (DSN 785-3636 x4518), email: [Ariel.Acebal@afit.edu](mailto:Ariel.Acebal@afit.edu)

#### **BAILEY, WILLIAM F.,**

Associate Professor 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. Professor 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 over 20 papers in refereed conference proceedings and international journals and chaired over 25 theses and dissertations. He is a member of Tau Beta Pi, Sigma Pi Sigma, and Sigma Xi. Tel. 937-255-3636 x4501 (DSN 785-3636 x4501), email: [William.Bailey@afit.edu](mailto:William.Bailey@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

"Physical Kinetics of Nonequilibrium Gas Flows." Sponsor: AFRL/RB. Funding: \$34,000.

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Josyula, E., and Bailey, Wm. F., "State-Specific Dissociation Modeling in Hypersonic Blunt Body Flow," *Proceedings of the 47<sup>th</sup> AIAA Aerospace Sciences Meeting*, Orlando Florida, AIAA, paper no. 2009-1579, 5-8 January 2009.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Rogers, N. and Bailey, W. F., "Multipactor Discharge Mitigation in High Power Microwave, HPM, Systems," oral presentation at the Ohio Section of the American Physical Society, Wright State University, Fairborn, OH, October 18, 2008.

Josyula, Eswar, Xu, Kun, Suchyta, Casmir, Bailey, William, "Kinetic Methods for Solving the Internal Structure of Shock Waves," 41st AIAA Thermophysics Conference, San Antonio Texas, 22 -25 June 2009.

**BOHN, MATTHEW J., Lt Col,**

Assistant Professor of Physics, Department of Engineering Physics, AFIT Appointment Date: 2005 (AFIT/ENP); retired June 2009; BS Physics, USAFA, 1988; MS Physics, 1993; PhD Optical Sciences, University of New Mexico, 1998. Lt Col Bohn's main research interests include ultrashort pulsed lasers, terahertz radiation and remote sensing. Specific application areas include compact monolithic femtosecond lasers for telecom and IR countermeasures; generation of high average power terahertz radiation in air plasma; detecting voids and damage in fiber composite materials using terahertz radiation; passive remote sensing of Uranyl compounds using phase fluorimetry. He previously taught at the US Air Force Academies and has conducted research in chemical lasers, nonlinear optical devices, laser gyroscopes, mid-infrared lasers, solid state lasers and remote sensing applications at the Air Force Research Laboratory and other assignments. He has published over 20 technical papers, reports and presentations. He is a member of the Optical Society of America and the IEEE. Dr. Bohn retired from the USAF in June 2009 and serves as an Adjunct faculty member at AFIT while working at Directed Energy Solutions (Colorado Springs, CO).

**SPONSOR FUNDED RESEARCH PROJECTS**

"Femtosecond Enhancement Cavity for High Average Power THz Generation." Sponsor: AFOSR. Funding: \$30,000.

**REFEREED JOURNAL PUBLICATIONS**

Bohn, Matthew J., Lundin, Michael A., and Marciniak, Michael A., "Frequency domain fluorimetry using a mercury vapor lamp," *Journal of Applied Remote Sensing*, Vol. 3, article no. 033524 (7 April 2009).

Stoik, Christopher D., Bohn, Matthew J., and Blackshire, James L., "Nondestructive evaluation of aircraft composites using transmissive terahertz time domain spectroscopy," *Optics Express*, Vol. 16, Issue 21, pp.17039-17051 (13 Oct 2008).

**REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW**

Fiorino, Steven T., Bartell, Richard J., Krizo, Matthew J., Marek, Seth L., Bohn, Matthew J., Randall, Robb M., and Cusumano, Salvatore J., "A Computational Tool for Evaluating THz Imaging Performance in Brownout Conditions at Land Sites throughout the World," *Proceedings of the SPIE, SPIE Defense and Security Symposium*, Vol. 7324, article no. 732410 (April 2009). [CDE]

**OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES**

Goodspeed, Allison S. and Bohn, Matthew J., "Measuring Negative Group Delay Dispersion Chirped Femtosecond Mirrors For a Modelocked Cr:LiSAF Laser," *Optical Fabrication and Testing (OFT)*, *Frontiers in Optics* 2008 Rochester, NY.

Bohn, Matthew, Guiney, William, and Lynch, Candace, "Temporal and spectral photoluminescence from HVPE grown GaAs," *Ohio Region Section of the American Physical Society (OSAPS)*, *Frontiers in Chemical Physics*, 10-11 October 2008, Dayton, OH.

Johnson, J., Bohn, M., Stoik, C., and Blackshire, J., "Non-Destructive Evaluation of Aerospace Composites," *Ohio Section of the American Physical Society (OSAPS)*, 10-11 October 2008, Dayton, OH.

Johnson, Jeremy, and Bohn, Matthew, "Terahertz NDE of Aerospace Composites," *34th Dayton-Cincinnati Aerospace Sciences Symposium*, March 03, 2009, Dayton, OH.

Johnson, J., Bohn, M., Stoik, C., and Blackshire, J., "Comparison of Traditional and Terahertz Imaging of Aerospace Composites for NDE," *33rd Dayton-Cincinnati Aerospace Sciences Symposium (DCASS)*, 3 March 2009, Dayton, OH.

Bohn, Matthew J., Stoik, Christopher D., and Blackshire, James L., "Terahertz Imaging of Aircraft Composites" Conference on Lasers and Electro-Optics (CLEO 2009), 3 Jun 2009, Baltimore, MD.

Johnson, J., Bohn, M., Stoik, C., and Blackshire, J., "Non-Destructive Evaluation of Aerospace Composites," Southeastern Universities Research Association (SURA) 2009 Terahertz Applications Symposium, 10-12 June 2009, Washington, DC.

Bohn, Matthew J. "Production of terahertz radiation in a laser-induced plasma," Directed Energy Society Workshop, Newton, MA, 1 Jul, 2009.

**BRIDGMAN, CHARLES J.,**

Professor Emeritus of Nuclear Engineering, Department of Engineering Physics, AFIT Appointment Date: 1960 (AFIT/ENP); BS, United States Naval Academy, 1952; MS, North Carolina State University, 1958; PhD, North Carolina State University, 1963. Dr. Bridgman's interests center around nuclear weapon effects and military nuclear power applications. He has been associated with nuclear weapon defense since 1952. He was a member of the first military team to be operational on the H-bomb. His current research interest is nuclear weapon fallout modeling. He is the author of a text book "Introduction to the Physics of Nuclear Weapons Effects" and of numerous technical articles in a wide variety of journals. In his 38 years on the AFIT faculty, he has chaired over 120 MS theses and PhD dissertations. He has received several awards including Tau Beta Pi Teacher of the Year and the Gage H. Crocker Outstanding Professor Award. Dr. Bridgman is a Fellow of the American Nuclear Society. Tel. 937-255-3636 x4679 (DSN 785-3636 x4679), email: [Charles.Bridgman@afit.edu](mailto:Charles.Bridgman@afit.edu)

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Panel member of the Nuclear Forensics Advisory Panel jointly hosted by The Department of Homeland Security, Domestic Nuclear Detection Office, and the Defense Threat Reduction Agency (DoD) – met at DHS, Washington, DC.

**BUNKER, DAVID J.,**

Assistant Professor of Engineering Physics, Department of Engineering Physics, AFIT Appointment Date: 2005 (AFIT/ENP); BS, Aerospace Engineering, Pennsylvania State University, 1984; MS, Mechanical Engineering, University of Dayton, 1988; PhD, Aerospace Engineering Sciences, University of Colorado, 1994. Dr Bunker's research interests include applications of measurement and signature technology, remote sensing, technical intelligence. Additional interests include high angle of attack and vertical flow structures, unsteady fluid dynamics, experimental wind tunnel testing, and low-speed fluid mechanics. Dr. Bunker served as Deputy Director of the Center for MASINT Studies and Research until June 2009.

SPONSOR FUNDED RESEARCH PROJECTS

"ONIR Ground Truth Support." Sponsor: NASIC. Funding: \$289,441. [CMSR]



**BURGGRAF, LARRY W.,**

Professor of Engineering Physics and Chemical Physics, Department of Engineering Physics, AFIT  
Appointment Date: 1991 (AFIT/ENP); BA, Chemistry, Olivet Nazarene University, 1968; MS, Chemistry, Ohio State University, 1971; MA, Applied Mathematics, University of West Florida, 1977; PhD, Chemistry, University of Denver, 1981; Postdoctoral Associate, Computational Chemistry, Iowa State University, 1994. Dr. Burggraf conducts experimental and theoretical research in surface spectroscopy, atomic force microscopy, positron spectroscopy and gamma spectroscopy to solve DoD and DOE problems in various areas including nano-materials; chemical, biochemical, and nuclear non-proliferation; radiation imaging; and nuclear fuels chemistry. Dr. Burggraf's research currently applies positron spectroscopy, gamma spectroscopy, photoluminescence spectroscopy, infrared spectroscopy, Raman spectroscopy, and atomic force microscopy to problems in solid state physics and problems in detection and non-proliferation of nuclear, chemical and biological weapons. Theoretical research to model surfaces and clusters centers on applying quantum mechanics models to interpret experimental results. Dr. Burggraf has more than 40 publications. Tel. 937-255-3636 x4507 (DSN 785-3636 x4507), email: [Larry.Burggraf@afit.edu](mailto:Larry.Burggraf@afit.edu)

**SPONSOR FUNDED RESEARCH PROJECTS**

"Role of Water in Heat Inactivation of Bacillus Anthracis Spores and Spores of Related Organisms."  
Sponsor: 709 Nuclear Systems Squadron. Funding: \$150,000.

**REFEREED JOURNAL PUBLICATIONS**

Beck, Eric V., Brozell, Scott R., Blaudeau, Jean-Philippe, Burggraf, Larry W., and Pitzer, Russell M., "Assessment of the Accuracy of Shape-Consistent Relativistic Effective Core Potentials Using Multireference Spin-Orbit Configuration Interaction Singles and Doubles Calculations of the Ground and Low-Lying Excited States of  $U^{4+}$  and  $U^{5+}$ ," *Journal of Phys. Chem. A*, vol. 113, pp. 12626–12631 (15 July 2009).

**REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW**

Li, Alex G., Burggraf, L. W., and Phillips, D., "Nanometer-Scale Elastic Modulus of Surfaces and Thin Films determined using an Atomic Force Microscope," *2009 IEEE Nanotechnology Materials and Devices Conference*, pp. 104-108 (2009), DOI://10.1109/NMDC.2009.5167570.

**OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES**

Contributed background papers and participated in CC briefing on bio-terrorism in AFIT-hosted seminar for Dr. Richard Danzig (former Sec of the Navy, senior advisor for DARPA and current defense policy advisor to President Barack Obama), 24 Oct 2008.

Gave invited department colloquium, "Positron and Positronium Chemistry Illustrated by Measurements and Modeling of the Positronic Dodecaborate Anion," Wayne State University, Condensed Matter Physics Series, Detroit, MI, 29 September 2009.

Prof. Burggraf was recognized by Dr. Ahmed Zewail (Nobel Laureate in Chemistry for inventing femtochemistry and member of President's Council of Advisors on Science and Technology) during his keynote speech 16 June 2009 at the 2009 HPC Users Group Meeting in San Diego. During Dr Zewail's talk he reviewed the events that led to sponsorship of his Nobel Prize work by AFOSR highlighting key roles of Dr. Larry Burggraf (AFIT/ENP) and Dr Larry Davis (DSRC HPC Modernization Office) and presented them with autographed copies of his autobiography.

Li, A. G., Burggraf, L.W., and Mall, S., "Dynamic atomic force microscopy for nanomechanical measurements," presented at the 34<sup>th</sup> Annual Dayton-Cincinnati Aerospace Sciences Symposium, Dayton, Ohio, 03 March 2009.

Herr, N. C., Li, A.G., and Burggraf, L.W., "Nanopatterning of polymer films using an AFM tip as a nano-hammer," presentation at the *2009 IEEE Nanotechnology Materials and Devices Conference 2009 (NMDC)*, Traverse City, Michigan, USA, June 2-5, 2009.

Li, A. G., and Burggraf, L.W., "Real-time imaging of generation and motion of nano-cracks in stresses polystyrene thin films using AFM," presentation at the *2009 IEEE Nanotechnology Materials and Devices Conference (NMDC)*, Traverse City, Michigan, USA, June 2-5, 2009.

Li, Alex G. and Burggraf, L.W., "Nanometer-Scale Elastic Modulus of Surfaces and Thin Films determined using an Atomic Force Microscope," invited presentation at the *2009 IEEE Nanotechnology Materials and Devices Conference (NMDC)*, Traverse City, MI, June 2-5, 2009.

#### **CUSUMANO, SALVATORE J.,**

Director, Center for Directed Energy, Assistant Professor of Optical Engineering, Department of Engineering Physics, AFIT Appointment Date: 2005 (AFIT/ENP); BS in EE, The United States Air Force Academy, 1971; MS in EE, Air Force Institute of Technology, 1977; PhD, Control Theory, University of Illinois, 1988. Dr. Cusumano's research interests span his 26 years of experience in directed energy and include resonator alignment and stabilization, Intra-Cavity Adaptive Optics, Phased Arrays, telescope control, pointing and tracking, adaptive optics and component technology for directed energy. He holds two patents (jointly) for his work in Phased Arrays. Dr. Cusumano is a member of the Directed Energy Professional Society. Tel. 937-255-3636 x7294 (DSN 785-3636 x7294), email: [Salvatore.Cusumano@afit.edu](mailto:Salvatore.Cusumano@afit.edu)

#### **SPONSOR FUNDED RESEARCH PROJECTS**

"FY09 HEL-JTO Model & Simulation TAWG Product Development." Sponsor: HEL-JTO. Funding: \$773,320. [CDE]

#### **SPONSOR FUNDED EDUCATIONAL PROJECTS**

"Laser Weapons System Short Course." Sponsor: MDA. Funding: \$18,100. [CDE]

#### **REFEREED JOURNAL PUBLICATIONS**

Fiorino, S.T. Bartell, R.J., Krizo, M.J., Perram, G.P., Fedyk, D.J., Moore, K.P., Harris, T.R., Cusumano, S.J., Richmond, R., and Gebhardt, M.J., "Worldwide assessments of laser radar tactical scenario performance variability for diverse low altitude atmospheric conditions at 1.0642  $\mu\text{m}$  and 1.557  $\mu\text{m}$ ," *Journal of Applied Remote Sensing*, Vol 3, article no. 03351 (March 2009). [CDE]

Fiorino, S.T., Bartell, R.J., Krizo, M.J., Perram, G.P., Fedyk, D.J., Moore, K.P., Harris, T. R., and Cusumano, S.J., "Worldwide Mission Planning Tool for Tactical High Energy Laser Systems Operating at Wavelengths Up to 14  $\mu\text{m}$ ," *American Institute of Aeronautics and Astronautics Journal of Aerospace Computing, Information, and Communication* (August 2009). [CDE]

#### **REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW**

Fiorino, Steven T., Bartell, Richard J., Krizo, Matthew J., Marek, Seth L., Bohn, Matthew J., Randall, Robb M., and Cusumano, Salvatore J., "A Computational Tool for Evaluating THz Imaging Performance in Brownout Conditions at Land Sites throughout the World," *Proceedings of the SPIE, SPIE Defense and Security Symposium*, Vol. 7324, article no. 732410 (April 2009). [CDE]

#### **OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES**

Fiorino, S.T., Randall, R.M., Echeverria, F.J., Bartell, R.J., Krizo, M.J., and Cusumano, S.J., "Effectiveness Assessment of Advanced Tactical Laser (ATL) Engagement Scenarios in the Troposphere," *6th AIAA Biennial National Forum on Weapon System Effectiveness*, Tucson, AZ, 22 September 2009.

Fiorino, S.T., Bartell, R.J., Krizo, M.J., Cummings, C., and Cusumano, S.J., "Aerosol Optical Properties and Index of Refraction Updates to the LEEDR Worldwide, Hyperspectral Atmospheric Characterization Package," *31st Review of Atmospheric Transmission Models Meeting*, Lexington, MA, 17 June 2009.

Fiorino, S.T., Cohen, J.J., McClung, B., Bartell, R.J., Krizo, M.J., and Cusumano, S.J., "Broad Spectrum, Three-Dimensional Optical Turbulence Assessments from Doppler Weather Radar," *7th DEPS Systems Symposium*, Monterey CA, 6-10 April 2009.

Krizo, M.J., Bartell, R.J., McCue, J.J., Fiorino, S.T., and Cusumano, S.J., "Performance Model of Laser Weapon Systems Comprised of Multiple Tiled Subapertures-Status," *7th DEPS Systems Symposium*, Monterey CA, 6-10 April 2009.

Fiorino, S.T., McClung, B., Cohen, J.J., Bartell, R.J., Krizo, M.J., Moore, K.P., Harris, T.R., and Cusumano, S.J., "Broad Spectrum Overland Surface Boundary Layer Optical Turbulence Assessments from Climatological Temperature, Pressure, Humidity, and Wind," *Directed Energy Professional Society 11th Annual DE Symposium*, Honolulu, HI, 17-21 November 2008.

Krizo, M.J., Bartell, R.J., Fiorino, S.T., Cusumano, S.J., and Whiteley, M., "Development of a Performance Model of Laser Weapon Systems Comprised of Multiple Tiled Subapertures," *Directed Energy Professional Society 11th Annual DE Symposium*, Honolulu, HI, 17-21 November 2008.

Bartell, R.J., Harris, T.R., Krizo, M.J., Fiorino, S.T., and Cusumano, S.J., "Assessment of Track Algorithm Performance vs Tactical Targets in Clutter as a Function of SWIR Track Sensor Characteristics," *Directed Energy Professional Society 11th Annual DE Symposium*, Honolulu, HI, 17-21 November 2008.

#### **FIORINO, STEVEN T.,**

Research Assistant Professor of Atmospheric 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 retrieval of environmental parameters via microwave remote sensing, development of 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, the American Institute of Aeronautics and Astronautics, the Directed Energy Professional Society and additionally holds a Master of Military Operational Art and Science from Air University (2003). Tel. 937-255-3636 x4506 (DSN 785-3636 x4506), email: [Steven.Fiorino@afit.edu](mailto:Steven.Fiorino@afit.edu)

#### **SPONSOR FUNDED RESEARCH PROJECTS**

"Support for Field Validation of AFIT CDE's Off-Axis Laser Irradiance Calculation Tool." Sponsor: HEL-JTO. Funding: \$50,000. [CDE]

#### **SPONSOR FUNDED EDUCATIONAL PROJECTS**

"2009 AFIT Center for Directed Energy Summer Intern Proposal." Sponsor: HEL-JTO. Funding: \$40,155. [CDE]

#### **REFEREED JOURNAL PUBLICATIONS**

Fiorino, S.T. Bartell, R.J., Krizo, M.J., Perram, G.P., Fedyk, D.J., Moore, K.P., Harris, T.R., Cusumano, S.J., Richmond, R., and Gebhardt, M.J., "Worldwide assessments of laser radar tactical scenario performance variability for diverse low altitude atmospheric conditions at 1.0642  $\mu\text{m}$  and 1.557  $\mu\text{m}$ ," *Journal of Applied Remote Sensing*, Vol 3, article no. 03351 (March 2009). [CDE]

Narcisse, D.L.C., Fiorino, S.T., Bartell, R.J., "Optimizing the Effectiveness of Directed Energy Weapons with Specialized Weather Support," *Air and Space Power Journal*. Vol XXIII, No. 2, pp. 57-66 (June 2009). [CDE]

Fiorino, S.T., Bartell, R.J., Krizo, M.J., Perram, G.P., Fedyk, D.J., Moore, K.P., Harris, T. R., and Cusumano, S.J., "Worldwide Mission Planning Tool for Tactical High Energy Laser Systems Operating at Wavelengths Up to 14  $\mu\text{m}$ ," *American Institute of Aeronautics and Astronautics Journal of Aerospace Computing, Information, and Communication* (August 2009). [CDE]

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Fiorino, Steven T., Bartell, Richard J., Krizo, Matthew J., Marek, Seth L., Bohn, Matthew J., Randall, Robb M., and Cusumano, Salvatore J., "A Computational Tool for Evaluating THz Imaging Performance in Brownout Conditions at Land Sites throughout the World," *Proceedings of the SPIE, SPIE Defense and Security Symposium*, Vol. 7324, article no. 732410 (April 2009). [CDE]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

President, Wright Memorial Chapter of the American Meteorological Society

Fiorino, S.T., McClung, B., Cohen, J.J., Bartell, R.J., Krizo, M.J., Moore, K.P., Harris, T.R., and Cusumano, S.J., "Broad Spectrum Overland Surface Boundary Layer Optical Turbulence Assessments from Climatological Temperature, Pressure, Humidity, and Wind," *Directed Energy Professional Society 11th Annual DE Symposium*, Honolulu, HI, 17-21 November 2008.

Krizo, M.J., Bartell, R.J., Fiorino, S.T., Cusumano, S.J., and Whiteley, M., "Development of a Performance Model of Laser Weapon Systems Comprised of Multiple Tiled Subapertures," *Directed Energy Professional Society 11th Annual DE Symposium*, Honolulu, HI, 17-21 November 2008.

Bartell, R.J., Harris, T.R., Krizo, M.J., Fiorino, S.T., and Cusumano, S.J., "Assessment of Track Algorithm Performance vs Tactical Targets in Clutter as a Function of SWIR Track Sensor Characteristics," *Directed Energy Professional Society 11th Annual DE Symposium*, Honolulu, HI, 17-21 November 2008.

Fiorino, S.T., Cohen, J.J., McClung, B., Bartell, R.J., Krizo, M.J., and Cusumano, S.J., "Broad Spectrum, Three-Dimensional Optical Turbulence Assessments from Doppler Weather Radar," *7th DEPS Systems Symposium*, Monterey CA, 6-10 April 2009.

Krizo, M.J., Bartell, R.J., McCue, J. J., Fiorino, S.T., and Cusumano, S.J., "Performance Model of Laser Weapon Systems Comprised of Multiple Tiled Subapertures-Status," *7th DEPS Systems Symposium*, Monterey CA, 6-10 April 2009.

Fiorino, S.T., Bartell, R.J., Krizo, M.J., Cummings, C., and Cusumano, S.J., "Aerosol Optical Properties and Index of Refraction Updates to the LEEDR Worldwide, Hyperspectral Atmospheric Characterization Package," *31st Review of Atmospheric Transmission Models Meeting*, Lexington, MA, 17 June 2009.

Fiorino, S.T., Randall, R.M., Echeverria, F.J., Bartell, R.J., Krizo, M.J., and Cusumano, S.J., "Effectiveness Assessment of Advanced Tactical Laser (ATL) Engagement Scenarios in the Troposphere," *6th AIAA Biennial National Forum on Weapon System Effectiveness*, Tucson, AZ, 22 September 2009.

**GILES, NANCY C.,**

Professor of Physics and Head, Department of Engineering Physics, AFIT Appointment Date: 2009 (AFIT/ENP); BS, University of North Carolina at Chapel Hill, 1981; PhD, North Carolina State University, 1987. Professor 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 over 160 archival publications in referred journals. Prior to joining AFIT, she was a physics faculty member at West Virginia University for 19 years. Her current work includes studies of scintillator materials (ZnO:Ga, CdWO<sub>4</sub>) for improved detection of nuclear radiation, wide band-gap semiconductors, and infrared non-linear optical materials for infrared countermeasures. Member of Optical Society of America, American Physical Society, and Materials Research Society. Tel. 937-255-3636, x4601 (DSN 785-3636,x4601), email: [Nancy.Giles@afit.edu](mailto:Nancy.Giles@afit.edu)

**REFEREED JOURNAL PUBLICATIONS**

Yang, Xiaocheng and Giles, N. C., "Hall effect analysis of bulk ZnO comparing different crystal growth techniques," *Journal of Applied Physics*, vol. 105, article no. 063709 (8 pages) (15 March 2009).

Neal, John S., Devito, David M., Armstrong, Beth L., Hong, M., Kesanli, B., Yang, X., Giles, Nancy C., Howe, Jane Y., Ramey, Joanne O., Wisniewski, D. J., Wisniewska, M., Munir, Zuhair A., and Boatner, Lynn A., "Investigation of ZnO-based polycrystalline ceramic scintillators for use as  $\alpha$ -particle detectors," *IEEE Transactions of Nuclear Sciences*, vol. 56, pp. 892-898 (June 2009).

**OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES**

DeVito, David M., Neal, John S., Yang, X., Hong, M., Armstrong, Beth L., Howe, Jane Y., Kesanli, B., Ramey, Joanne O., Giles, Nancy C., Munir, Zuhair A., and Boatner, Lynn A., "*Fabrication of Polycrystalline Zinc Oxide Scintillators for Radiation Detection*," oral presentation at the Spring 2009 Meeting of the Materials Research Society (San Francisco, CA), Symp. L: Nuclear radiation Detection Materials (L 11.3), April 16, 2009.

Yang, Xiaocheng, DeVito, David M., Hong, Mei, Neal, John S., Munir, Zuhair A., Howe, Jane Y., Boatner, Lynn A., and Giles, Nancy C., "*Scintillation and Photoluminescence from Ceramic ZnO and ZnO:Ga*," poster presentation at Spring 2009 Meeting of the Materials Research Society (San Francisco, CA), Symp. L: Nuclear radiation Detection Materials (L 9.8), April 15, 2009.

Giles, Nancy C., Yang, Shan, Halliburton, Larry E., Fernelius, Nils C., Schunemann, Peter G., and Zawilski, Kevin T., "*Identification and characterization of point defects in CdSiP<sub>2</sub> crystals*," oral presentation at the 17<sup>th</sup> American Conference on Crystal Growth and Epitaxy (Lake Geneva, Wisconsin), Symposium: Nonlinear Optical and Laser Host Materials-II, August 11, 2009.

**GROSS, KEVIN C.,**

Assistant 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' research is currently focused on the remote sensing of chemically-evolving systems in the battle space (detonation fireballs, muzzle flashes, rocket & jet engine plumes, smokestack effluents, etc.) using hyperspectral, spectroscopic, radiometric, and high-speed imagery techniques. Interests also include instrumentation development and methods for decoupling atmospheric attenuation from source emission in spectroscopic measurements of remote targets. He has advised 3 MS students, co-advised 3 PhD students, and has received 5 research grants during his first two years on the AFIT faculty. Tel: 937-255-3636 x4558 (DSN 785-3636 x4558), email: [Kevin.Gross@afit.edu](mailto:Kevin.Gross@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

"Classifying Transient Event Signatures Using a Spectro-Kinetic Model." Sponsor: AS&T. Funding: \$147,102. [CMSR]

"ONIR Ground Truth Support." Sponsor: NASIC. Funding: \$289,441. [CMSR]

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Gross K.C., Randall, R.M., Perram, G.P., "Atmospheric Correction Algorithm for Moderate-Resolution Infrared Spectral Measurements," Air & Waste Management Association's 102<sup>nd</sup> Annual Conference and Exhibition, Detroit, MI, June 2009. Paper 2009-A-473-AWMA, ISBN: 9781933474052. [CDE, CMSR]

Bradley K.C., Gross, K.C.; Perram, G.P., "Imaging Fourier Transform Spectrometry of Industrial Smokestack Effluents." Air & Waste Management Association's 102<sup>nd</sup> Annual Conference and Exhibition, Detroit, MI, June 2009. Paper 2009-A-85-AWMA, ISBN: 9781933474052. [CMSR]

Bradley, K.C., Bowen, S.J. Gross, K.C., Marciniak, M.A., Perram, G.P., "Imaging Fourier Transform Spectrometry of Jet Engine Exhaust with the Telops FIRST-MWE," Aerospace Conference, 2009 IEEE, pp. 1-8 (2009), DOI://10.1109/AERO.2009.4839444. Big Sky MT, March 2009. [CMSR]

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Gross, K.C., Gordon, J.M., Perram, G.P., "Temporally resolved infrared spectra from the detonation of advanced munitions," Proceedings of SPIE, Vol. 7330, 733006, Orlando FL, April 2009. [CMSR]

Bradley, K.C., Gross, K.C., Perram, G.P., "Imaging Fourier transform spectrometry of chemical plumes," Proceedings of SPIE, Vol. 7304, 73040J, Orlando FL, April 2009. [CMSR]

Gross, K.C., Moore, E.A., Bowen, S.J. Chamberland, M., Farley, V., Gagnon, J.-P., Lagueux, P., "Characterizing and overcoming spectral artifacts in imaging Fourier-transform spectroscopy of turbulent exhaust plumes," Proceedings of SPIE, Vol. 7304, 730416, Orlando FL, April 2009. [CMSR]

West, L., Gimmetstad, G. Herkert, R., Smith, B., Kireev, S., Daniels, T., Cornman, L., Sharman, B., Weekley, A., Perram, G.P., Gross, K.C., Smith, G.W., Feltz, W., Taylor, J., Olson, E., "Hazard Detection Analysis for a Forward-Looking Interferometer," 1<sup>st</sup> AIAA Atmospheric and Space Environment Conference, AIAA, paper no. 2009-3635, San Antonio TX, June 2009.

Tremblay, P., Gross, K.C., Farley, V., Chamberland, M., Villemarie, A., Perram, G.P., "Understanding and overcoming scene-change artifacts in imaging Fourier-transform spectroscopy of turbulent jet engine exhaust," Proceedings of SPIE, Vol. 7457, pp. 74570F-13, San Diego CA, August 2009, DOI://10.1117/12.828001.

Nunez, A.S.; Mendenhall, M.J.; Gross, K., "Melanosome level estimation in human skin from hyperspectral imagery," WHISPERS '09: First Workshop on Hyperspectral Image and Signal Processing, pp. 1-4, Grenoble, France, 26-28 Aug 2009, DOI://10.1109/WHISPERS.2009.5289039.

#### BOOKS AND CHAPTERS IN BOOKS

Gross K. C., Perram G. P., "The Phenomenology of High Explosive Fireballs from Fielded Spectroscopic and Imaging Sensors for Event Classification" in Selected Topics in Electronics and Systems – Vol 48. World Scientific Publishing, Hackensack, NJ, pp. 277-288, 2009, ISBN-13: 978-981-283-323-5. [CMSR]

## OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Schott, B., Gross, K.C., Perram, G.P., "Infrared spectra of detonation fireballs," Ohio Sectional Meeting of the American Physical Society, 10-11 October 2008, Dayton, OH. [CMSR]

Bowen, S., Bradley, K.C., Gross, K.C., Perram, G.P. and Marciniak, M.A., "Hyperspectral imaging of aircraft exhaust plumes," Ohio Section of the American Physical Society, 10-11 October 2008, Dayton, OH. [CMSR]

Slagle, S.E., Perram, G.P., Gross, K.C., "Advanced radiometry for detonation fireball characterization," 4<sup>th</sup> Annual Advanced Signatures and Technology Symposium, National Ground Intelligence Center, Charlottesville, VA, 18 November 2008. [CMSR]

Bowen, S., Marciniak, M.A., Bradley, K.C., Perram, G.P. and Gross, K.C., "Hyperspectral imaging of a turbine engine exhaust plume to determine radiance, temperature and concentration spatial distributions," Proceedings of the 2009 Meeting of the Military Sensing Symposia (MSS) Specialty Group on Electro-Optical & Infrared Countermeasures (IRCM), Vol. 1, IE05, Las Vegas, NV, April 2009.

Gross, K.C., Slagle, S.E., Perram, G.P., "Advanced Radiometry for Characterization of Transient Combustion Events," 15th NASIC Spectral Analyst Exchange Forum, NASIC, Wright-Patterson AFB OH, 28 May 2009. [CMSR]

Gross, K.C., Perram, G.P., "Remote Sensing in support of the Counter-IED Problem," JIEDDO Signatures IPT, Washington D.C., 23 September 2009. [CMSR]

## **HAGER, GORDON,**

Research Professor of Chemical Physics, Department of Engineering Physics, (AFIT/ENP); BS, Western Washington University, 1968; PhD, Washington State University, 1973. Professor Hager's research primary focuses on high power chemical and gas phase lasers, including laser device development, characterization and scaling. His current research emphasizes the spectroscopy and kinetics of diode pumped alkali lasers for tactical weapons applications. He has advised 8 MS and 8 PhD students and 8 Postdoctoral researchers. He has published over 50 refereed articles and led the team demonstrating the first supersonic Chemical Oxygen-Iodine Laser, now the weapon aboard the Airborne Laser.

## REFEREED JOURNAL PUBLICATIONS

Zweiback, Jason, Hager, Gordon, and Krupke, William F., "High efficiency hydrocarbon-free resonance transition potassium laser," *Optics Communications*, Vol. 282, pp. 1871-1873, 1 May 2009. [CDE]

## **HAWKS, MICHAEL R., Lt Col,**

Assistant Professor of Optical Engineering, 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, 2005. Lt Col Hawks' main research interests include electro-optic and infrared (EO/IR) remote sensing. Specific application areas include monocular passive ranging and hyperspectral and polarimetric imaging. He previously taught at the US 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 published 13 technical papers, reports and presentations. He is a Fellow of the Society of Optical Countermeasures Engineers, Managers and Scientists and a member of the Directed Energy Professional Society. Tel. 937-255-3636 x4828 (DSN 785-3636 x4828), email: [Michael.Hawks@afit.edu](mailto:Michael.Hawks@afit.edu)

## SPONSOR FUNDED RESEARCH PROJECTS

"Enhanced Monocular Passive Ranging." Sponsor: NASIC. Funding: \$50,000.



"Femtosecond Enhancement Cavity for High Average Power THz Generation." Sponsor: AFOSR. Funding: \$30,000.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Hawks, Michael R. and Perram, Glen P., "Use of Band Models to Describe Absorption over Inhomogeneous Paths," 31<sup>st</sup> *Atmospheric Transmission Models Meeting*, 16-17 June 2009, Lexington, MA. [CMSR]

#### **HENGESOLD, ROBERT L.,**

Professor 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. Professor Hengesold's research areas center around experimental solid state physics, semiconductor physics, optical diagnostics and electron and laser spectroscopy. He is the author of over 100 archival publications and over 215 presentations at technical meetings. He has served as advisor on over 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 superlattice structures for mid-infrared diode lasers and detectors. This work involves collaborative efforts with the Directed Energy and the Sensors Directorates of AFRL and DTRA. He has 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 for 1999. He was elected a Fellow of the American Physical Society in 2008. Tel. 937-255-3636, x4502 (DSN 785-3636, x4502), email: [Robert.Hengesold@afit.edu](mailto:Robert.Hengesold@afit.edu)

#### REFEREED JOURNAL PUBLICATIONS

Ryu, Mee-Yi, Yeo, Y. K., and Hengesold, R. L., "Structural and Optical Characterization of Si-Implanted  $\text{Al}_{0.18}\text{Ga}_{0.82}\text{N}$ ," *Solid State Communications*, vol. 149, pp. 319-321 (Jan. 2009).

Moore, E.A., Yeo, Y. K., Ryu, Mee-Yi, and Hengesold, R. L., "Nearly Perfect Electrical Activation Efficiencies from Silicon-Implanted  $\text{Al}_x\text{Ga}_{1-x}\text{N}$  with High Aluminum Mole fraction," *Journal of Electronic Materials*, vol. 38, pp. 153-158 (Jan. 2009).

Yuldashev, Sh.U., Khabibullaev, P.K., Nusretov, R.A., Khvan, Yeo, Y.K., Hengesold, R.L., and Kang, T.W., "Electroluminescence of n- $\text{Zn}_{1-x}\text{Mg}_x\text{O/p-Zn}_{1-x}\text{Mg}_x\text{O}$  Heterostructures Grown on Si-Substrates," *Journal of the Korean Physical Society*, vol. 53, pp. 2913-2916 (Nov. 2008).

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Serves as Honors and Awards Chair of the Ohio Region Section of the American Physical Society.

Ryu, Mee-Yi, Moore, E. A., Yeo, Y. K., and Hengesold, R. L., "Optical and Electrical Activation Studies of Si-Implanted  $\text{Al}_{0.45}\text{Ga}_{0.55}\text{N}$ ," presented at the Fall 2008 Meeting of the Korean Physical Society held on 24-25 October 2008 in Gwangju, Korea.

Wei, J., Guha, S., Gonzalez, L., Dutta, P., Rajagoplan, G., Yeo, Y. K., and Hengesold, R. L. "Optical and Electrical Characterization of Melt-Grown Bulk Ternary  $\text{In}_x\text{Ga}_{1-x}\text{As}$ ," presented at the March 2009 Meeting of the American Physical Society held on 16-20 March 2009 in Pittsburgh, Pennsylvania.

Wei, J., Gonzalez, L., Guha, S. Yeo, Y. K., Hengesold, R. L., and Rajagoplan G., "Electrical and Optical Properties of Melt-Grown Optical Grade  $\text{In}_x\text{Ga}_{1-x}\text{As}$  and  $\text{InAs}_y\text{P}_{1-y}$ ," presented at the 17<sup>th</sup> American Conference on Crystal Growth and Epitaxy held on 9-14 August 2009 in Lake Geneva, Wisconsin.



**HOLTGRAVE, JEREMY C., Lt Col,**

Assistant Professor of Physics and Deputy Head, Department of Engineering Physics, AFIT Appointment Date: 2007 (AFIT/ENP); BS Physics, University of Illinois, 1990; MS Engineering Physics, Air Force Institute of Technology, 1992; PhD Physics, Air Force Institute of Technology, 2003. Lt Col Holtgrave's main research interests include atomic and molecular physics with applications to the area of directed energy weapons. Tel. 937-255-3636 x4649 (DSN 785-3636 x4649), email: [Jeremy.Holtgrave@afit.edu](mailto:Jeremy.Holtgrave@afit.edu)

**JOHN, GEORGE,**

Professor Emeritus of Nuclear Engineering, Department of Engineering Physics, (AFIT/ENP); BSc, Ohio State University, 1948; PhD, Ohio State University, 1952. Professor John's research areas are applications of nuclear radiation and radionuclides to problems in science and engineering. This includes applications of Mössbauer spectrometry to problems in materials sciences, analysis of radionuclides in the environment, development of nuclear radiation detectors and general techniques for detecting and analyzing nuclear radiation. Current research emphases are on applications of Mössbauer Spectrometry in the development of lubricants in collaboration with the Air Force Research Laboratory Materials Directorate at WPAFB. Other areas of interest are: the natural radiation background and health physics.

**KOWASH, BENJAMIN R., Capt,**

Assistant Professor of Nuclear Engineering, Department of Engineering Physics, AFIT Appointment Date: 2008 (AFIT/ENP); BS, Nuclear Engineering, Oregon State University, 2000; BS, Mechanical Engineering, Oregon State University, 2000; MS, Nuclear Engineering, Air Force Institute of Technology, 2002; PhD, Nuclear Engineering, University of Michigan, 2008. Capt Kowash's research interests include the fields of radiation detection and measurements (emphasis on imaging) and nuclear reactor design and analysis. His current research considers autonomous radiation imaging systems for the stand-off detection (10-100 meters) of lost or hidden radioactive sources over wide fields of view. His other interests include adaptive imaging systems and models, radiation shielding, radiation interactions with matter, and the nuclear fuel cycle. He is a member of the American Nuclear Society and IEEE. Tel. 937-255-3636 x4571 (DSN 785-3636 x4571), email: [Benjamin.Kowash@afit.edu](mailto:Benjamin.Kowash@afit.edu)

**REFEREED JOURNAL PUBLICATIONS**

Kowash, B.R., Wehe, D.K., and Fessler, J.A., "A Rotating Modulation Imager for Locating Mid-Range Point Sources," *Nuclear Instruments and Methods in Physics Research – Section A*, vol. 602-2, pp. 477-483 (April 2009).

**OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES**

Kowash, B.R. and Wehe, D.K., "An Empirical Study of the Mask Transmission Function in Rotationally Modulation Collimators by Means of a HPGe Strip Detector," poster presentation at the Fall 2008 IEEE Nuclear Science Symposium (Dresden, Germany), 22 October 2008.

**LI, ALEX GUANGMING,**

Research Assistant Professor, Department of Engineering Physics, AFIT Appointment Date: 1995 (Research Associate), 2008 (Research Faculty); PhD in Materials Science, 1990, Chinese Academy of Sciences at Shanghai Institute of Optics and Fine Mechanics; MS in Materials Science, 1987, Chinese Academy of Sciences at Shanghai Institute of Optics and Fine Mechanics; BS in Materials Science, 1982, Changchun University of Science and Technology. Dr Li teaches the AFIT Materials Characterization (MATL 680) and Materials Processing and Selection (MATL 685) courses. His research interest is in developing AFM techniques for measuring nanometer-scale elastic modulus of surfaces, including biological materials at elevated temperatures. He has invented a novel AFM nano-patterning technique for producing sub-100 nm nanostructures in polymers. He authored over two dozens of archival publications in referred journals. Additional research involves laser processing and characterizing surface morphologies of glasses, ceramics, semiconductors, polymers, nano-carbon composites, and biological spores using AFM, SEM, TEM, optical interferometer, and optical microscopes; identifying and analyzing chemical compositions and structures using FTIR, Raman (micro-Raman), photoluminescence, EPR, XPS, ESCA, SEM, TEM, and XRD. Tel. 937-255-3636 x4576, e-mail: [Alex.Li@afit.edu](mailto:Alex.Li@afit.edu)

**REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW**

Li, Alex G., Burggraf, L. W., and Phillips, D., "Nanometer-Scale Elastic Modulus of Surfaces and Thin Films determined using an Atomic Force Microscope," *2009 IEEE Nanotechnology Materials and Devices Conference*, pp. 104-108 (2009), DOI://10.1109/NMDC.2009.5167570.

**OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES**

Chaired two sessions titled "Nanowire Growth and Characterization" and "Nanomaterials and Systems" at the *2009 IEEE Nanotechnology Materials and Devices Conference*, Traverse City, Michigan, 2-5 June 2009.

Gave a presentation at the *AFRL Nanotechnology STT* meeting on 11 August 2009 about Nano-Carbon Arrays for RF Emitters for Directed Energy Applications.

Li, Alex G. and Burggraf, L.W., "Nanometer-scale elastic modulus of surfaces and thin films determined using an atomic force microscope," invited presentation at the *IEEE Nanotechnology Materials and Devices Conference*. Traverse City, Michigan, 2-5 June 2009.

Li, A. G., Burggraf, L.W., and Mall, S., "Dynamic atomic force microscopy for nanomechanical measurements," presented at the *34<sup>th</sup> Annual Dayton-Cincinnati Aerospace Sciences Symposium*. Dayton, Ohio, 03 March 2009.

Herr, N. C., Li, A.G., and Burggraf, L.W., "Nanopatterning of polymer films using an AFM tip as a nano-hammer," presentation at the *2009 IEEE Nanotechnology Materials and Devices Conference 2009 (NMDC)*, Traverse City, Michigan, USA, June 2-5, 2009.

Li, A. G., and Burggraf, L.W., "Real-time imaging of generation and motion of nano-cracks in stresses polystyrene thin films using AFM," presentation at the *2009 IEEE Nanotechnology Materials and Devices Conference (NMDC)*, Traverse City, Michigan, USA, June 2-5, 2009.

**MAGNUS, AMY L., Maj,**

Assistant Professor of Engineering Physics, Department of Engineering Physics, AFIT Appointment Date: 2007 (AFIT/ENP); BSEE, Rochester Institute of Technology, 1990; MSEE, Air Force Institute of Technology, 1995; PhD, Air Force Institute of Technology, 2003. Maj Magnus's has conducted and managed research in near and remote sensing, pattern recognition, machine intelligence, network science, and distributed intelligence. Her research interests are comprehensive summaries of data collections and ubiquitous computing (i.e., sensing concepts and signal processing for local networks) including signal-to-symbol pattern recognition and query-based knowledge assessments of sensor management systems. Maj Magnus has published 11 articles and is writing a book on artificial intelligence and sensing networks. Tel. 937-255-3636 x4555 (DSN 785-3636 x4555), email: [Amy.Magnus@afit.edu](mailto:Amy.Magnus@afit.edu)

**REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW**

McAtee, K.R., Marciniak, M.A., Wunderlich, M.E., Vershure, E., and Magnus, A.L., "Survey of contrast and gain control techniques for infrared focal planes under laser illumination," *Proceedings of the 2009 Parallel Meetings of the Military Sensing Symposia (MSS) Specialty Groups on Passive Sensors; Battlefield Survivability & Discrimination; Materials; and Detectors, Vol. 1*, PD05, Orlando, FL, February 2009. [CDE]

**MARCINIAK, MICHAEL A.,**

Associate 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. Professor Marciniak's research interests include optical and infrared signatures, and opto-electronic material and device physics. He has published 15 refereed and 31 other publications, and has chaired two PhD and 37 MS thesis committees. He is a retired Lt Col, USAF, with 22 years of service. Tel. 937-255-3636 x4529 (DSN 785-3636 x4529), email: [Michael.Marciniak@afit.edu](mailto:Michael.Marciniak@afit.edu)

**SPONSOR FUNDED RESEARCH PROJECTS**

"BRDF Measurement Research." Sponsor: AFMC. Funding: \$100,000.

"Infrared Counter-Countermeasure Research." Sponsor: AFRL/RX. Funding: \$15,000.

"RF/Optical/Thermal Metamaterials Research." Sponsor: AFRL/RX. Funding: \$71,000.

**REFEREED JOURNAL PUBLICATIONS**

Cole, W.P., Marciniak, M.A., and Haeri, M.B., "Atmospheric-turbulence-effects correction factors for the laser range equation," *Optical Engineering*, Vol 47, article no. 126001 (December 2008).

Bohn, Matthew J., Lundin, Michael A., and Marciniak, Michael A., "Frequency domain fluorimetry using a mercury vapor lamp," *Journal of Applied Remote Sensing*, Vol. 3, article no. 033524 (7 April 2009).

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Bradley, Kenneth L., Bowen, Spencer, Gross, Kevin C., Marciniak, Michael A., and Perram, Glen P., "Imaging Fourier Transform Spectrometry of Jet Engine Exhaust with the Telops FIRST-MWE," *IEEE Aerospace Conference*, Paper 5.0502, pp. 1-8, March 7-14, 2009, Big Sky, Montana. [CMSR]

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

- Rasmussen, J.D., Marciniak, M.A. and Haeri, M.B., "Image-based laser jam detection in infrared focal-plane array detectors," *Proceedings of the 2009 Parallel Meetings of the Military Sensing Symposia (MSS) Specialty Groups on Passive Sensors; Battlefield Survivability & Discrimination; Materials; and Detectors*, Vol. 1, article no. PD04, Orlando, FL, February 2009. [CDE]
- McAtee, K.R., Marciniak, M.A., Wunderlich, M.E., Vershure, E. and Magnus, A.L., "Survey of contrast and gain control techniques for infrared focal planes under laser illumination," *Proceedings of the 2009 Parallel Meetings of the Military Sensing Symposia (MSS) Specialty Groups on Passive Sensors; Battlefield Survivability & Discrimination; Materials; and Detectors* Vol. 1, article no. PD05, Orlando, FL, February 2009. [CDE]
- Tatar, J. and Marciniak, M.A., "Wave optics simulation of optical retro-reflection in laser interrogation scenario," *Proceedings of the 2009 Meeting of the Military Sensing Symposia (MSS) Specialty Group on Electro-Optical & Infrared Countermeasures (IRCM)*, Vol. 1, article no. ID11, Las Vegas, NV, April 2009. [CDE]
- Bowen, S., Marciniak, M.A., Bradley, K.C., Perram, G.P. and Gross, K.C., "Hyperspectral imaging of a turbine engine exhaust plume to determine radiance, temperature and concentration spatial distributions," *Proceedings of the 2009 Meeting of the Military Sensing Symposia (MSS) Specialty Group on Electro-Optical & Infrared Countermeasures (IRCM)*, Vol. 1, article no. IE05, Las Vegas, NV, April 2009. [CMSR]
- Balling, B.L. and Marciniak, M.A., "Comparative BRDF study of several surfaces as potential MWIR diffuse reflectance standards," *Proc. of the SPIE*, Vol. 7453, article no. 74530O-1, San Diego, CA, August 2009.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

- Bowen, S., Bradley, K.C., Gross, K.C., Perram, G.P. and Marciniak, M.A., "Hyper-spectral imaging of aircraft exhaust plumes," 2008 Ohio Section of the American Physical Society Fall Meeting (C5.00003), 10-11 October 2008, Dayton, OH. [CMSR]
- Balling, B.L. and Marciniak, M.A., "The Bi-Directional Reflectance Distribution Function (BRDF) – Measurement and Analysis Techniques," 2008 Ohio Section of the American Physical Society Fall Meeting (C8.00001), 10-11 October 2008, Dayton, OH.
- Tatar, J.J., Cole, W.P. and Marciniak, M.A., "Wave Optics Simulation and Prediction of Retro-reflections from Optical Systems," 2008 Ohio Section of the American Physical Society Fall Meeting (C8.00003), 10-11 October 2008, Dayton, OH. [CDE]
- Lamott, R.B. and Marciniak, M.A., "Bi-directional Scatter Distribution Function (BSDF) Measurements of Large Area Photonic Crystals," 2008 Ohio Section of the American Physical Society Fall Meeting (C8.00006), 10-11 October 2008, Dayton, OH.
- Grice, P. and Marciniak, M.A., "Image-based BRDF acquisition," Directed Energy Professional Society 11<sup>th</sup> Annual Symposium, 17-21 November 2008, Honolulu, HI. [CDE]
- Cole, W.P. and Marciniak, M.A., "Signatures of laser-illuminated devices," 2008 Advanced Signatures Technology Symposium, 18-20 November 2008, Charlottesville, VA. [CDE]
- Lamott, R.B., Marciniak, M.A. and Cunningham, B., "Bi-directional Scatter Distribution Function (BSDF) measurements of Guided Mode Resonance Filter optical limiters," American Physical Society March 2009 Meeting (V10 3), 16-20 March 2009, Pittsburgh, PA.

Hoelscher, M.G. and Marciniak, M.A., "Restoration of scene information reflected from non-specular media," Directed Energy Professional Society 4<sup>th</sup> Systems Symposium, 6-10 April 2009, Monterey, CA. [CDE]

Balling, B.L. and Marciniak, M.A., "Investigation of several materials, including Spectralon, as a potential 3.39  $\mu\text{m}$  MWIR BRDF standard," 2009 CALCON Technical Conference, 24-27 August 2009, Logan, UT.

#### **MATHEWS, KIRK A.,**

Professor 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 19 papers in refereed journals and 16 conference proceedings, and has chaired 31 theses and 13 dissertations. He is a member of the American Nuclear Society and Tau Beta Pi. Tel. 937-255-3636 x4508 (DSN 785-3636 x4508), email: [Kirk.Mathews@afit.edu](mailto:Kirk.Mathews@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

"AFTAC/TM- AFIT/EN MOA 2008 Support." Sponsor: AFTAC. Funding: \$50,000.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Member, Satellite Sensor Review Panel, Air Force Technical Applications Center.

#### **McCLORY, JOHN W., Lt Col,**

Assistant 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. Lieutenant Colonel McClory's expertise is in radiation effects on electronic devices, semiconductor device characterization, radiation detector development, and nuclear weapon effects. LTC McClory's research includes using combinations of electrical, optical and absorption spectroscopy to gain information on the damaging effects of ionizing and non-ionizing radiation on narrow and wide band gap materials. It also includes the interaction of radiation with matter, particularly focused on the characterization and improvement of nuclear radiation detectors. He is currently the advisor of three Master's and two PhD students. LTC McClory is a liaison officer from the Defense Threat Reduction Agency and the Senior US Army representative at AFIT. Tel. 937-255-3636 x7308 (DSN 785-3636 x7308), email: [John.McClory@afit.edu](mailto:John.McClory@afit.edu).

#### SPONSOR FUNDED RESEARCH PROJECTS

"DTRA-AFIT Nuclear Partnership." Sponsor: DTRA. Funding: \$100,000.

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Wooten, David, Ketsman, I., Xiao, Jie, Losovyj, Ya. B., Petrosky, J., McClory, John, Burak, Ya. Adamiv, V.T., and Dowben, P.A., "Differences in the Surface Charging at the (100) and (110) Surfaces of  $\text{Li}_2\text{B}_4\text{O}_7$ ," Nuclear Radiation Detection Materials — 2009, edited by D.L. Perry, A. Burger, L. Franks, K. Yasuda, M. Fiederle (Mater. Res. Soc. Symp. Proc. Volume 1164, Warrendale, PA, 2009), 1164-L04-04.

Dowben, P. A., Wooten, D., Losovyj, Y., Petrosky, J., McClory, John, Wang, W., and Tang, J., "Surface charging of n-type  $\text{Gd}_2\text{O}_3$  and  $\text{HfO}_2$  thin films," in Rare-Earth Doping of Advanced Materials for Photonic Applications, edited by V. Dierolf, Y. Fujiwara, U. Hommerich, P. Ruterana, J. Zavada (Mater. Res. Soc. Symp. Proc. Volume 1111, Warrendale, PA, 2009), 1111-D07-16.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Dowben, Peter, McClory, John, Brand, J. I., Belashchenko, K. D., Losovyj, and Ya. B., "Novel Rare-Earth Semiconductors for Solid-State Neutron Detectors and Thin High-k Dielectrics." Contributed talk at the Defense Threat Reduction Agency Basic Research Technical Review, 3-5 November 2008, Springfield, VA.

Wooten, David, Dowben, P. A., Losovyj, Y., Petrosky, J., McClory, John, Wang, W., and Tang, J., "Surface charging of n-type  $\text{Gd}_2\text{O}_3$  and  $\text{HfO}_2$  thin films." Poster presentation at the Materials Research Society Fall Meeting, 1-4 December 2008, Boston, MA.

McClory, John, Arnold, D.M., Lam, E., Petrosky, J. C., and Kim, Y.C., "Stability of Gamma Irradiated Synchronous Dynamic Random Access Memory (SDRAM)." Poster presentation at the Hardened Electronics and Radiation Technology Conference, 1-4 April 2009, Albuquerque, NM.

McClory, John, McGary, J., Petrosky, J., Mall, S., Farlow G., and Hansen, N. D., "Electrostatic Discharge Properties of Irradiated Nanocomposites." Poster presentation at the Hardened Electronics and Radiation Technology Conference, 1-4 April 2009, Albuquerque, NM.

McClory, John, Lam, E., Arnold, D.M., Kim, Y.C., and Petrosky, J. C., "Evaluation of Retention Characteristics in Dynamic Random Access Memory Using Reconfigurable Computers for Low-cost In-situ Radiation Reliability Testing." Poster presentation at the Hardened Electronics and Radiation Technology Conference, 1-4 April 2009, Albuquerque, NM.

Petrosky, James C., Schultz, David, McClory, John, Natta, Markus, Schemm, Nathan, Balkir, S., Hoffman, Michael, Bauer, Mark, Brand, J.I., Tang, Jinke, Wang, Wendong, and Dowben, Peter A., "Single Neutron Pulse Counting with p-type Gd Doped  $\text{HfO}_2$  Thin Film Heterojunctions with Silicon." Contributed talk at the Materials Research Society Spring Meeting, 13-17 April 2009, San Francisco, CA.

Wooten, David, Ketsman, I., Xiao, Jie, Losovyj, Ya. B., Petrosky, J., McClory, John, Burak, Ya. V., Adamiv, V.T., and Dowben, P.A., "Differences in the Surface Charging at the (100) and (110) Surfaces of  $\text{Li}_2\text{B}_4\text{O}_7$ ." Contributed talk at the Materials Research Society Spring Meeting, 13-17 April 2009, San Francisco, CA.

McClory, John, Moran, J. T., Petrosky, J. C., and Farlow, G. C., "The Effects of Temperature and Electron Radiation on the Electrical Properties of  $\text{AlGaIn/GaN}$  Heterostructure Field Effect Transistors." Poster presentation at the IEEE Nuclear and Space Radiation Effects Conference, 20-24 July 2009, Quebec City, Canada.

#### **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, reaction kinetics, atomic and molecular spectroscopy, environmental science, photochemistry, optical diagnostics, and remote sensing. He has advised 23 PhD and 38 MS students, received 38 research grants and published over 40 journal articles during his twenty years on the AFIT faculty. Tel. 937-255-3636 x4504 (DSN 785-3636 x4504), email: [Glen.Perram@afit.edu](mailto:Glen.Perram@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

"AFIT Analysis Support to JIEDDO Task 2b." Sponsor: JIEDDO. Funding: \$47,436. [COA]

"AFOSR Center of Excellence in High Power Gas Phase Electric and Hybrid Laser Kinetics and Spectroscopy." Sponsor: AFOSR. Funding: \$59,471. [CDE]

"Center of Excellence for Gas Phase Hybrid Lasers: Additional Student Support." Sponsor: AFOSR. Funding: \$67,195. [CDE]

"High Power Diode Pumped Alkali Vapor Lasers and Analog Systems." Sponsor: HEL-JTO. Funding: \$352,450. [CDE]

"Measure High Priority Kinetic Rates for DPALS." Sponsor: AFRL/RD. Funding: \$30,000. [CDE]

"Thermal Control of Diode Pumped Alkali Lasers Using Heat Pipes." Sponsor: HEL-JTO. Funding: \$40,000. [CDE]

#### SPONSOR FUNDED EDUCATIONAL PROJECTS

"Technical and Administrative Support for the AFOSR Center of Excellence in High Power Gas Phase and Electric Lasers." Sponsor: AFRL/RD. Funding: \$85,000. [CDE]

#### REFEREED JOURNAL PUBLICATIONS

Bostick, Randall L. and Perram, Glen P., "Hyperspectral Imaging using Chromotomography: A Fieldable Visible Instrument for Transient Events," *International Journal of High Speed Electronics and Systems (IJHSES)*, vol. 18, pp. 519-529 (December 2008). [CMSR]

Phillips, Grady T. and Perram, Glen P., "Crossed-beam inter-modulated fluorescence spectroscopy as a spatially-resolved temperature diagnostic for supersonic nozzles," *Applied Optics*, vol. 48, pp. 4917-4921 (September 2009). [CDE]

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Bradley, Kenneth L., Bowen, Spencer, Gross, Kevin C., Marciniak, Michael A., and Perram, Glen P., "Imaging Fourier Transform Spectrometry of Jet Engine Exhaust with the Telops FIRST-MWE," *IEEE Aerospace Conference*, Paper 5.0502, pp. 1-8, March 7-14, 2009, Big Sky, Montana. [CMSR]

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Bowen, S., Marciniak, M.A., Bradley, K.C., Perram, G.P. and Gross, K.C., "Hyperspectral imaging of a turbine engine exhaust plume to determine radiance, temperature and concentration spatial distributions," *Proceedings of the 2009 Meeting of the Military Sensing Symposia (MSS) Specialty Group on Electro-Optical & Infrared Countermeasures (IRCM)*, Vol. 1, paper no. IE05, Las Vegas, NV, April 2009. [CMSR]

Gross, Kevin C., Perram, Glen P., Tremblay, Pierre, and Farley, Vincent, "Understanding and Overcoming Scene Change Artifacts in Imaging Fourier Transform Spectroscopy of a Turbulent Jet Engine," *Optical Engineering and Applications, Proceedings of the SPIE*, vol 7457, paper no. 74570F, 2-6 August 2009, San Diego, CA. [CMSR]

Chamberland, Martin, Farley, Vincent, Gagnon, Jean-Philippe, Lagueux, Philippe and Villemare, André, Gross, Kevin C., and Perram, Glen P., "Characterizing and overcoming spectral artifacts in imaging Fourier-transform spectroscopy of turbulent exhaust plumes," *SPIE Defense and Security Symposium*, 13-17 April 2009, Orlando, FL, *Proceedings of the SPIE*, Vol. 7304, paper no.730416 (May 2009). [CMSR]

Bostick, Randall L., Gross, Kevin C. and Perram, Glen P., "Design and Characterization of a Hyperspectral Chromotomographic Imaging System for Battlespace Defense," *SPIE Defense and Security Symposium*, 13-17 April 2009, Orlando, FL, *Proceedings of the SPIE*, Vol. 7319, paper no.731903, May 2009. [CMSR]

Moore, Elizabeth A., Gross, Kevin C., Bowen, Spencer J., Perram, Glen P., Chamberland, Martin, Farley, Vincent, Gagnon, Jean-Philippe, and Laquex, Philippe, "Characterizing and Overcoming Spectral Artifacts in Imaging Fourier-Transform Spectroscopy of Turbulent Exhaust Plumes," *SPIE Defense and Security Symposium*, 13-17 April 2009, Orlando, FL, *Proceedings of the SPIE*, vol 7304, paper no.730416, May 2009. [CMSR]

Gordon, Joe, Gross, Kevin, and Perram, Glen, "Temporally-resolved, infrared spectra from the detonation of advanced munitions," *SPIE Defense and Security Symposium*, 13-17 April 2009, Orlando, FL, Proc. SPIE, Vol. 7330, paper no. 733006 (May 2009). [CMSR]

Bradley, Kenneth C., Gross, Kevin C., and Perram, Glen P., "Imaging Fourier Transform Spectrometry (IFTS) of Chemical Plumes," *SPIE Defense and Security Symposium*, 13-17 April 2009, Orlando, FL, Proc. SPIE, Vol. 7304, 73040J (May 2009). [CMSR]

#### BOOKS AND CHAPTERS IN BOOKS

Gross K. C. and Perram G. P., "The Phenomenology Of High Explosive Fireballs from Fielded Spectroscopic And Imaging Sensors for Event Classification" in *Selected Topics in Electronics and Systems – Vol 48*. World Scientific Publishing, Hackensack, NJ, pp. 277-288, 2009, ISBN-13: 978-981-283-323-5. [CMSR]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Hawks, Michael R. and Perram, Glen P., "Use of Band Models to Describe Absorption over Inhomogeneous Paths," *31<sup>st</sup> Atmospheric Transmission Models Meeting*, 16-17 June 2009, Lexington, MA. [CMSR]

Slagle, Steven E., Perram, Glen P., Gross, Kevin C., "Advanced radiometry for detonation fireball characterization," *4th Annual Advanced Signatures Technology Symposium*, November 2008. [CMSR]

Postell, David J., Dolson, David A., and Perram, Glen P., "Laser-Excited Fluorescence Spectroscopy of  $Br_2$ : NIR Transitions to High Vibrational Levels in the X State," Ohio Sectional Meeting of the American Physical Society, 10-11 October 2008, Dayton, Ohio. [CDE]

Schott, Benjamin, Gross, Kevin, and Perram, Glen, "Infrared spectra of the detonation fireballs" Ohio Sectional Meeting of the American Physical Society, 10-11 October 2008, Dayton, Ohio. [CMSR]

Wertepny, Douglas, Pitz, Greg, and Perram, Glen, "Pressure broadening and shifting of the Cesium D1 and D2 lines by rare gases" Ohio Sectional Meeting of the American Physical Society, 10-11 October 2008, Dayton, Ohio. [CDE]

Rice, Chris and Perram, Glen, "Rugged TDLAS system for High Energy Laser atmospheric propagation characterization" Ohio Sectional Meeting of the American Physical Society, 10-11 October 2008, Dayton, Ohio. [CDE]

Lange, Matthew A., Pitz, Greg A., and Perram, Glen P., "Production of Singlet Oxygen within a Flow Discharge" Ohio Sectional Meeting of the American Physical Society, 10-11 October 2008, Dayton, Ohio. [CDE]

Bowen, S., Bradley, K.C., Gross, K.C., Perram, G.P. and Marciniak, M.A., "Hyper-spectral imaging of aircraft exhaust plumes," 2008 Ohio Section of the American Physical Society Fall Meeting (C5.00003), 10-11 October 2008, Dayton, OH. [CMSR]

West, Leanne, Gimmestad, Gary, Herkert, Ralph, Smith, Bill, Kireev, Stanislav, Daniels, Taumi, Cornman, Larry, Sharman, Bob, Weekley, Andrew, Perram, Glen, Gross, Kevin, Smith, Greg, Feltz, Wayne, Taylor, Joe, and Olson, Erik, "Hazard Detection Analysis for a Forward-Looking Interferometer," *1st AIAA Atmospheric and Space Environment Conference*, 20-25 June 2009, San Antonio, TX. [CMSR]



Bradley, Kenneth C., Gross, Kevin C., and Perram, Glen P., "Imaging Fourier Transform Spectrometry of Industrial Smokestack Effluents," *Air and Waste Management Association 102<sup>nd</sup> Annual Conference*, 16-19 June 2009, Detroit, MI. [CMSR]

Rice, Chris and Perram, Glen P., "A Rugged TDLAS System for Open Path Monitoring," *Air and Waste Management Association 102<sup>nd</sup> Annual Conference*, 16-19 June 2009, Detroit, MI. [CDE]

Randall, Robb M., Gross, Kevin, and Perram, Glen, "Characterize Atmospheric Infrared Active Trace Gases from Infrared Exothermic and Effluent Materials stand-off Detection Event Signatures," *Air and Waste Management Association 102<sup>nd</sup> Annual Conference*, 16-19 June 2009, Detroit, MI. [CDE, CMSR]

#### **PETROSKY, JAMES C.,**

Assistant 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. Dr. Petrosky's 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, and Electron Paramagnetic Resonance spectroscopy (EPR); 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. Tel. 937-255-3636 x4562 (DSN 785-3636 x4562), email: [James.Petrosky@afit.edu](mailto:James.Petrosky@afit.edu)

#### **SPONSOR FUNDED RESEARCH PROJECTS**

"Analysis of Thermal Flash Effects on Surfaces for Post-Event Nuclear Forensics." Sponsor: DTRA. Funding: \$266,300.

"Support Activities to Homeland Security." Sponsor: DNDO. Funding: \$ 156,000.

"Support to NNSA for QUASPR Review." Sponsor: NNSA. Funding: \$19,697.

#### **SPONSOR FUNDED EDUCATIONAL PROJECTS**

"DTRA GNE Student Support." Sponsor: DTRA. Funding: \$160,570.

"AFRL GNE Student Support." Sponsor: AFRL/RD. Funding: \$61,266.

#### **REFEREED JOURNAL PUBLICATIONS**

Losovyj, Ya. B., Wooten, D., Santana, J. Colon, An, J. Michael, Belashchenko, K. D., Lozova, N., Petrosky, J., Sokolov, A., Tang, Jinke, Wang, Wendong, Arulsamy, N., and Dowben, P.A., "Comparison of n-type Gd<sub>2</sub>O<sub>3</sub> and Gd-doped HfO<sub>2</sub>," *Journal of Physics - Condensed Matter*, vol. 21, article no. 045602 (Jan 2009).

T. Komesu, H. K. Jeong, David Wooten, Ya. B. Losovyj, J. N. Crain, M. Bissen, F. J. Himpsel, J. Petrosky, Jinke Tang, Wendong Wang, I.N. Yakovkin, P. A. Dowben, "4f hybridization and band dispersion in gadolinium thin films, and compounds," *Physica Status Solidi (b)* vol. 46, no. 5 pp. 975-980 (May 2009).

## REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Wooten, David, Ketsman, I., Xiao, Jie, Losovyj, Ya. B., Petrosky, J., McClory, John, Burak, Ya. Adamiv, V.T., and Dowben, P.A., "Differences in the Surface Charging at the (100) and (110) Surfaces of  $\text{Li}_2\text{B}_4\text{O}_7$ ," Nuclear Radiation Detection Materials — 2009, edited by D.L. Perry, A. Burger, L. Franks, K. Yasuda, M. Fiederle (Mater. Res. Soc. Symp. Proc. Volume 1164, Warrendale, PA, 2009), 1164-L04-04.

Dowben, P. A., Wooten, D., Losovyj, Y., Petrosky, J., McClory, John, Wang, W., and Tang, J., "Surface charging of n-type  $\text{Gd}_2\text{O}_3$  and  $\text{HfO}_2$  thin films," in Rare-Earth Doping of Advanced Materials for Photonic Applications, edited by V. Dierolf, Y. Fujiwara, U. Hommerich, P. Ruterana, J. Zavada (Mater. Res. Soc. Symp. Proc. Volume 1111, Warrendale, PA, 2009), 1111-D07-16.

## OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Member, American Nuclear Society Risk Management Working Group.

Chair, QASPR Review Committee.

Wright Scholars Program, Annual Heritage Tour Guide – Nuclear Reactor Building, WPAFB.

Wooten, David, Dowben, P. A., Losovyj, Y., Petrosky, J., McClory, John, Wang, W., and Tang, J., "Surface charging of n-type  $\text{Gd}_2\text{O}_3$  and  $\text{HfO}_2$  thin films." Poster presentation at the Materials Research Society Fall Meeting, 1-4 December 2008, Boston, MA.

McClory, John, Arnold, D.M., Lam, E., Petrosky, J. C., and Kim, Y.C., "Stability of Gamma Irradiated Synchronous Dynamic Random Access Memory (SDRAM)." Poster presentation at the Hardened Electronics and Radiation Technology Conference, 1-4 April 2009, Albuquerque, NM.

McClory, John, McGary, J., Petrosky, J., Mall, S., Farlow G., and Hansen, N. D., "Electrostatic Discharge Properties of Irradiated Nanocomposites." Poster presentation at the Hardened Electronics and Radiation Technology Conference, 1-4 April 2009, Albuquerque, NM.

McClory, John, Lam, E., Arnold, D.M., Kim, Y.C., and Petrosky, J. C., "Evaluation of Retention Characteristics in Dynamic Random Access Memory Using Reconfigurable Computers for Low-cost In-situ Radiation Reliability Testing." Poster presentation at the Hardened Electronics and Radiation Technology Conference, 1-4 April 2009, Albuquerque, NM.

Petrosky, James C., Schultz, David, McClory, John, Natta, Markus, Schemm, Nathan, Balkir, S., Hoffman, Michael, Bauer, Mark, Brand, J.I., Tang, Jinke, Wang, Wendong, and Dowben, Peter A., "Single Neutron Pulse Counting with p-type Gd Doped  $\text{HfO}_2$  Thin Film Heterojunctions with Silicon." Contributed talk at the Materials Research Society Spring Meeting, 13-17 April 2009, San Francisco, CA.

Wooten, David, Ketsman, I., Xiao, Jie, Losovyj, Ya. B., Petrosky, J., McClory, John, Burak, Ya. V., Adamiv, V.T., and Dowben, P.A., "Differences in the Surface Charging at the (100) and (110) Surfaces of  $\text{Li}_2\text{B}_4\text{O}_7$ ." Contributed talk at the Materials Research Society Spring Meeting, 13-17 April 2009, San Francisco, CA.

Mall, S., Petrosky, J. C., Harder, B.T., Alexander, M. D., Hansen, G., and Hansen, N. D., "Investigation in Nickel Nanostrands<sup>TM</sup> based Nanocomposites for Space Applications," presented at the Hardened Electronics and Radiation Technology Conference, 1-4 April 2009, Albuquerque, NM.

McClory, John, Arnold, D.M., Lam, E., Petrosky, J. C., and Kim, Y.C., "Stability of Gamma Irradiated Synchronous Dynamic Random Access Memory (SDRAM)." Poster presentation at the Hardened Electronics and Radiation Technology Conference, 1-4 April 2009, Albuquerque, NM.

McClory, John, McGary, J., Petrosky, J., Mall, S., Farlow G., and Hansen, N. D., "Electrostatic Discharge Properties of Irradiated Nanocomposites." Poster presentation at the Hardened Electronics and Radiation Technology Conference, 1-4 April 2009, Albuquerque, NM.

McClory, John, Lam, E., Arnold, D.M., Kim, Y.C., and Petrosky, J. C., "Evaluation of Retention Characteristics in Dynamic Random Access Memory Using Reconfigurable Computers for Low-cost In-situ Radiation Reliability Testing." Poster presentation at the Hardened Electronics and Radiation Technology Conference, 1-4 April 2009, Albuquerque, NM.

**RANDALL, ROBB M., Maj,**

Assistant Professor of Atmospheric Physics, Department of Engineering Physics, AFIT Appointment Date: 2007 (AFIT/ENP); BS, Meteorology, The University of Oklahoma, 1995; MS, Meteorology, Air Force Institute of Technology, 2002; PhD, Atmospheric Sciences, The University of Arizona, 2007. Maj Randall's research interests include understanding and characterizing the atmosphere and atmospheric effects of remote sensing retrievals, evaluating uncertainty in high-energy laser engagement due to atmospheric effects and understanding how climate change affects weapon systems and high altitude sensing platforms. Maj Randall is a member of the American Meteorological Society, American Geophysical Union and The Institute of Electrical and Electronics Engineers. Tel. 937-255-3636 x7423 (DSN 785-3636 x7423), email:

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REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Gross K.C., Randall, R.M., Perram, G.P., "Atmospheric Correction Algorithm for Moderate-Resolution Infrared Spectral Measurements," Air & Waste Management Association's 102<sup>nd</sup> Annual Conference and Exhibition, Detroit, MI, June 2009. Paper 2009-A-473-AWMA, ISBN: 9781933474052. [CDE, CMSR]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Fiorino, S.T., Bartell, R.J., Krizo, M.J., Marek, S.L., Bohn, M.J., Randall, R.M, and Cusumano, S.J., "A Computational Tool for Evaluating THz Imaging Performance in Brownout Conditions at Land Sites throughout the World," *SPIE Defense and Security Symposium, Proceedings of the SPIE*, vol. 7324, paper no. 732410, Orlando, FL, April 2009.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Fiorino, S.T., Randall, R.M., Echeverria, F.J., Bartell, R.J., Krizo, M.J., and Cusumano, S.J., "Effectiveness Assessment of Advanced Tactical Laser (ATL) Engagement Scenarios in the Troposphere," *6th AIAA Biennial National Forum on Weapon System Effectiveness*, Tucson, AZ, 22 September 2009.

**RIES, HEIDI R.,**

Associate Professor of Physics, Department of Engineering Physics AFIT Appointment Date: 1999 (AFIT/ENP) and Dean for Research, Graduate School of Engineering and Management (AFIT/ENR) BS, Physics, The Ohio State University, 1982; MS, Physics, The Ohio State University, 1984; PhD, Applied Physics, Old Dominion University, 1987. Dr Ries' research interests include 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, VA and as Associate Director of the Applied Research Center at the Jefferson Center for Research and Technology Research Park, Newport News, VA. Dr Ries was elected to the ASEE Engineering Research Council Board of Directors in 2008. Tel. 937-255-3636, x4544 (DSN 785-3636, x4544), email:

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### SPONSOR FUNDED EDUCATIONAL PROJECTS

"In the Footsteps of Katharine Wright: Promoting STEM Women through LEADER (Launching Equity in the Academy across the Dayton Entrepreneurial Region." Sponsor: NSF. Funding: \$26,958.

### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Board of Directors, ASEE Engineering Research Council.

Accreditation Review Council, Higher Learning Commission of the North Central Association.

### **SHEELY, EUGENE V., Lt Col,**

Assistant Professor of Chemical Physics, Department of Engineering Physics, AFIT Appointment Date: 2008 (AFIT/ENP); BS Chemistry, Brigham Young University, 1988; MS Physical Chemistry, University of Idaho, 1993; PhD Theoretical Physical Chemistry, University of Idaho, 1997. LTC Sheely's major areas of research include muon-catalyzed nuclear fusion and molecular dynamics. Prior to joining AFIT, he served as the Academics Director of the Defense Nuclear Weapons School (DNWS), as the leader of a Defense Threat Reduction Agency Consequence Management Advisory Team and as the Chief of Environmental Health Physics and the Chief of Occupational Health Physics at the Air Force Institute for Operational Health. Tel. 937-255-3636 x4569 (DSN 785-3636 x4569), email: [Eugene.Sheely@afit.edu](mailto:Eugene.Sheely@afit.edu)

### **TUTTLE, RONALD F.,**

Associate Professor of Nuclear Engineering and Director, Center for Measurement and Signature Intelligence (MASINT) Technologies, 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 are applications of active and passive remote sensing, spectroscopy, diagnostics, and signals processing to problems in intelligence collection and exploitation. Other areas of interest are 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. Tel. 937-255-3636 x4536 (DSN 785-3636 x4536), email: [Ronald.Tuttle@afit.edu](mailto:Ronald.Tuttle@afit.edu)

### SPONSOR FUNDED RESEARCH PROJECTS

"Advanced Sensor Integration Study." Sponsor: OSD. Funding: \$50,000. [CMSR]

"Advanced Technical Intelligence Research Support." Sponsor: NASIC. Funding: \$95,000. [CMSR]

"Chief Technology Office (CMSR)." Sponsor: SAF. Funding: \$328,745. [CMSR]

"Counterspace Research and Academic Support." Sponsor: NASIC. Funding: \$200,000. [CMSR]

"Development of Computer Assisted and Computer Automated Image Analysis Tools for Wide Area Persistent Surveillance for Military Operations." Sponsor: Leonard Wood Institute. Funding: \$115,000. [CMSR]

"Project Lake Effect- Phase 1." Sponsor: NASIC. Funding: \$230,000. [CMSR]

"Project Seven- Phase 1." Sponsor: DoD HQ. Funding: \$50,000. [CMSR]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Graham, Kathrine M., Tuttle, Ronald F., and Jordan, Jay B., "Countering Denial and Deception Methodologies Used to Hide a Plutonium Production Reactor: Morphological Analysis to Build Signature Collection Requirements," Advanced Signatures Technology Symposium, NGIC, Charlottesville, VA 18-20 Nov 2008.

#### **WEEKS, DAVID E.,**

Professor of Physics, Department of Engineering Physics AFIT Appointment Date: 1993 (AFIT/ENP); BA Physics with honors, 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 to compute associated state to state reactive scattering matrix elements. A second area of interest centers on the application of k.p theory together with the envelope function approximation to model the electronic and optical properties of quantum well heterostructures. Tel. 937-255-3636 x4561 (DSN 785-3636 x4561), email: [David.Weeks@afit.edu](mailto:David.Weeks@afit.edu)

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Ohio Section of the American Physical Society, Chair-Elect 2009-2010

Weeks, D.E. and Lacy, B.R., "A Wigner Distribution Analysis of Scattering Dynamics," 2009 Joint Spring Meeting of the Ohio Sections of the American Physical Society and the American Association of Physics Teachers, held in Ada, OH, 24-25 April 2009.

Garvin, M.B. and Weeks, D.E., "The Adiabatic-to-Diabatic Mixing Angle for B + H<sub>2</sub> Potential Energy Surfaces," 2008 Joint Meeting of the APS Ohio-Region Section, Dayton, OH, 10-11 October 2008.

#### **WOLF, PAUL J.,**

Professor of Physics, Department of Engineering Physics, AFIT Appointment Date: 1994 (AFIT/ENP); and 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's research interests include experimental atomic/molecular spectroscopy, reactive and non-reactive collision kinetics, laser-based thin film deposition processes, ionospheric and atmospheric chemistry, environmental monitoring, and non-linear dynamics with a focus on complex systems. He has published over 20 papers and advised two PhD and five MS students. Tel. 937-255-3636 x4560 (DSN 785-3636 x4560), email: [Paul.Wolf@afit.edu](mailto:Paul.Wolf@afit.edu)

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

American Physical Society, Councilor (2004 - 2008).

American Physical Society, Chair, Audit Committee (2008-2009).

Ohio-Section of the American Physical Society, Executive Committee - Council Representative.

Higher Learning Commission, Consultant-Evaluator.

**YEO, YUNG KEE,**

Professor of Physics, Department of Engineering Physics, AFIT Appointment Date: 1984 (AFIT/ENP); BS, Seoul National University, 1961; PhD, University of Southern California, 1972. Professor Yeo's research interests are in the area of solid state physics, especially characterization of the electrical, magnetic, and optical properties of elemental, compound, ternary, and quaternary semiconductors using techniques such as Hall-effect measurement, deep level transient spectroscopy, superconducting quantum interference device, magnetic circular dichroism, cathodoluminescence, electroluminescence, and photoluminescence. Professor Yeo has published more than 100 articles in archival journals, several technical reports, presented more than 190 papers at professional conferences, and holds one patent. He is a reviewer for the Applied Physics Letters, the Journal of Applied Physics, and Journal of Electronic Materials. He is currently funded by the AFOSR to study narrow band gap semiconductors such as InGaAs and InAsP, and GeSn and SiGeSn. This work involves collaborative effort with the Air Force Research Laboratory, University of Rensselaer Polytechnic Institute, University of Arizona State, University of Delaware, and Rutgers University. He has directed the research of six post-doctoral fellows, 16 PhD students, and 24 MS students. He received the Ezra Kotcher Award for 1990, received the Gage H. Crocker Outstanding Professor Award for 1992, and received General Bernard A. Schriever Award for 1997. Tel. 937-255-3636 x4532 (DSN 785-3636 x4532), email: [Yung.Yeo@afit.edu](mailto:Yung.Yeo@afit.edu)

**SPONSOR FUNDED RESEARCH PROJECTS**

"Investigation of Optical and Electrical Properties of Bulk InGaAs and InAsP for Optoelectronic Device Applications." Sponsor: AFOSR. Funding: \$54,780.

**REFEREED JOURNAL PUBLICATIONS**

Ryu, Mee-Yi, Yeo, Y. K., and Hengehold, R. L., "Structural and Optical Characterization of Si-Implanted  $\text{Al}_{0.18}\text{Ga}_{0.82}\text{N}$ ," *Solid State Communications*, vol. 149, pp. 319-321, Jan. 2009.

Moore, E.A., Yeo, Y. K., Ryu, Mee-Yi, and Hengehold, R. L., "Nearly Perfect Electrical Activation Efficiencies from Silicon-Implanted  $\text{Al}_x\text{Ga}_{1-x}\text{N}$  with High Aluminum Mole Fraction," *Journal of Electronic Materials*, vol. 38, pp. 153-158, Jan. 2009.

Yuldashev, Sh.U., Khabibullaev, P.K., Nusretov, R.A., Khvan, Yeo, Y.K., Hengehold, R.L., and Kang, T.W., "Electroluminescence of n- $\text{Zn}_{1-x}\text{Mg}_x\text{O}$ /p- $\text{Zn}_{1-x}\text{Mg}_x\text{O}$  Heterostructures Grown on Si-Substrates," *Journal of the Korean Physical Society*, vol. 53, pp. 2913-2916 (Nov. 2008).

**OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES**

Served as an International Advisory Committee member of the 30th International Conference on the Physics of Semiconductors.

Ryu, Mee-Yi, Moore, E. A., Yeo, Y. K., and Hengehold, R. L., "Optical and Electrical Activation Studies of Si-Implanted  $\text{Al}_{0.45}\text{Ga}_{0.55}\text{N}$ ," Presented at the Fall 2008 Meeting of the Korean Physical Society held on 24-25 October 2008 in Gwangju, Korea.

Wei, J., Guha, S., Gonzalez, L., Dutta, P., Rajagoplan, G., Yeo, Y. K., and Hengehold, R. L. "Optical and Electrical Characterization of Melt-Grown Bulk Ternary  $\text{In}_x\text{Ga}_{1-x}\text{As}$ ," Presented at the March 2009 Meeting of the American Physical Society held on 16-20 March 2009 in Pittsburgh, Pennsylvania.

Wei, J., Gonzalez, L., Guha, S. Yeo, Y. K., Hengehold, R. L., and Rajagoplan G., "Electrical and Optical Properties of Melt-Grown Optical Grade  $\text{In}_x\text{Ga}_{1-x}\text{As}$  and  $\text{InAs}_y\text{P}_{1-y}$ " presented at the 17<sup>th</sup> American Conference on Crystal Growth and Epitaxy held on 9-14 August 2009 in Lake Geneva, Wisconsin.

## **5.4. DEPARTMENT OF MATHEMATICS AND STATISTICS**

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**5.4.1 [MASTER'S THESES](#) 138**

**5.4.2 [GRADUATE RESEARCH PAPERS](#) 138**

**5.4.3 [FACULTY RESEARCH OUTPUT](#) 139**

#### **5.4.1. MASTER'S THESES**

KNIGHT, EMILY A., *Modeling Thermal Inactivation of Bacillus Spores*. AFIT/GAM/ENC/09-01. Faculty Advisor: Dr. William P. Baker. Sponsor: AFMC/CX.

TRAHAN, ELIZABETH N., *An Evaluation of Growth Models as Predictive Tools for Estimates at Completion (EAC)*. AFIT/GFA/ENC/09-01. Faculty Advisor: Dr. Edward D. White. Sponsor: Southern Utah University.

WORDEN, THOMAS E., *A Comparison of the U.S. Air Force Fitness Test and Sister Services' Combat-Oriented Fitness Tests*. AFIT/GEM/ENC/09-01. Faculty Advisor: Dr. Edward D. White. Sponsor: N/A.

#### **5.4.2. GRADUATE RESEARCH PAPERS**

LIPINA, ANDREW J., *Identifying Critical Factors Affecting Combat Mission Ready Status Among USAF Europe's Aircrew*. AFIT/IOA/ENC/09-01. Faculty Advisor: Maj Shay Capehart. Sponsor: HQ USAF.



### 5.4.3. FACULTY RESEARCH OUTPUT

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

#### **BAKER, WILLIAM P.,**

Associate Professor of Mathematics, Department of Mathematics and Statistics, AFIT Appointment Date: 1994 (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 is in 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 (DSN 785-3636 x4517), email: [William.Baker@afit.edu](mailto:William.Baker@afit.edu)

#### REFEREED JOURNAL PUBLICATIONS

Stevens R. and W. P. Baker, Optimal control of a librating electro-dynamic tether performing an orbit change, *Journal of Guidance, Control, and Dynamics* **32**, No. 5 (2009), 1497-1507.

Shepherd M. J., R. G. Cobb, and W. P. Baker, Modal transformation method for deformable membrane mirrors, *Journal of Guidance, Control, and Dynamics* **32**, No. 1 (2009), 276-289.

Reed, S., A. Palazotto, and W. P. Baker, An experimental technique for the evaluation of strain dependent material properties of hard coatings, *Journal of Shock and Vibrations* **15** (2008), 697-712.

#### **BARR, DAVID R.,**

Associate Professor Emeritus of Statistics, Department of Mathematics and Statistics, (AFIT/ENC); BA, Miami University, 1954; MA, Miami University, 1954; MS, Miami University, 1957; PhD, State University of Iowa, 1964. Dr. Barr's research interests include probability, statistics and stochastic processes, as well as the design of experiments.

#### **BULUTOGLU, DURSUN A.,**

Assistant 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 are on finding GMA (generalized minimum aberration) 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 (DSN 785-3636 x4704), email: [Dursun.Bulutoglu@afit.edu](mailto:Dursun.Bulutoglu@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

"Algorithmic Tools for Finding Efficient Designs and Test Suites for Test and Evaluation." Sponsor: AFOSR. Funding: \$46,893.

#### REFEREED JOURNAL PUBLICATIONS

Bulutoglu, D. A. and D. M. Kaziska, A counterexample to Beder's conjectures about Hadamard matrices, *Journal of Statistical Planning and Inference* **139**, No. 9 (2009), 3381-3383.

Bulutoglu, D. A. and K. J. Ryan, D-optimal and near D-optimal  $2^k$  fractional factorial designs of resolution V *Journal of Statistical Planning and Inference* **139**, No. 1 (2009), 16-22.

## OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Bulutoglu, D. A. "Classification of Orthogonal Arrays by Integer Programming," AFOSR Program Meeting, Arlington, VA., April 2009.

Bulutoglu, D. A. "Classification of Orthogonal Arrays by Integer Programming," Mathematics Colloquium, Wright State University, May 2009.

Reviewer, *Utilitas Mathematica, International Journal of Applied Mathematics and Statistics, Statistical Methodology*.

Reviewer, grant requesting access to the Ohio Supercomputer Center.

### **BUSH, BRETT A., Maj,**

Assistant Professor of Statistics, Department of Mathematics and Statistics, AFIT Appointment Date: 2006, (AFIT/ENC); BS, United States Air Force Academy, 1997; MBA, Louisiana Tech University, 1999; MS, Northeastern University, 2002; PhD, North Carolina State University, 2006. Maj Bush's research interests include nonlinear optimization and applied statistics. His previous military assignments have been in nuclear weapons test and evaluation; and modeling, simulation, and analysis of C4ISR systems. Tel. 937-255-3636 x7125, email:

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### **CAPEHART, SHAY R., Maj,**

Assistant Professor of Statistics, Department of Mathematics and Statistics, AFIT Appointment Date: 2008, (AFIT/ENC); BS, US Air Force Academy, 1996; MS, Air Force Institute of Technology, 2000; PhD, Arizona State University, 2008. Maj Capehart's primary research interests include design of experiments, optimization, and integer programming. He has served as an Air Force analytical scientist for 12 years including long-range strategic fiscal planning, operational test and evaluation, and early research and development in high capacity storage materials. Tel. 937-255-3636 x4516, email: [Shay.Capehart@afit.edu](mailto:Shay.Capehart@afit.edu)

### **CHAPIN, PATRICK S., Capt,**

Assistant Professor of Statistics, Department of Mathematics and Statistics, AFIT Appointment Date: 2009, (AFIT/ENC); BS, United States Air Force Academy, 2002; MS, Air Force Institute of Technology, 2004; PhD, Iowa State University, 2009. Capt Chapin's research interests include computer experiments, validation of computer models, design of experiments, MCMC simulation and Bayesian Statistics. He has served as an Air Force analytical scientist for 3 years including manpower/force structure analysis and BRAC cost analysis. Tel. 937-255-3636 x3320 (DSN 785-3636 x3320), email: [Patrick.Chapin@afit.edu](mailto:Patrick.Chapin@afit.edu)

### **DEA, JOHN R., Lt Col,**

Assistant Professor of Mathematics, Department of Mathematics and Statistics, AFIT Appointment Date: 2008 (AFIT/ENC); BS, Baylor University, 1993; MS, Creighton University, 1998; PhD, Naval Postgraduate School, 2008. LtCol Dea's research interests include numerical analysis of fluid flow and wave propagation, including recent papers on non-reflecting boundary conditions for modeling wave propagation in a truncated portion of a large or infinite domain. LtCol Dea's previous military assignments include software development for strategic war-planning systems, flight test support and coordination, and architecture and systems engineering for long-term space superiority mission area planning. Tel. 937-255-3636 x4584, email: [John.Dea@afit.edu](mailto:John.Dea@afit.edu)

## REFEREED JOURNAL PUBLICATIONS

Neta, B., V. van Joolen, J. Dea, and D. Givoli, Application of high-order Higdon non-reflecting boundary conditions to linear shallow water models, *Communications in Numerical Methods in Engineering* **24** (2008), 1459-1466.

Dea, J., F. X. Giraldo, and B. Neta, High-order non-reflecting boundary conditions for the linearized 2-D Euler equations: no mean flow case, *Wave Motion* **46** (2009), 210-220.

**DILLARD, KAREN E. M., Lt Col,**

Assistant Professor of Mathematics, Department of Mathematics and Statistics, AFIT Appointment Date: 2007, (AFIT/ENC); BS, Rensselaer Polytechnic Institute, 1994; MS, University of Massachusetts - Lowell, 1997; PhD, North Carolina State University, 2007. Lt Col Dillard's research interests include numerical analysis and optimization. She was previously assigned as a personnel officer, instructor at USAFA, and scientific analyst involved with analysis of alternatives. Tel. 937-255-3636 x4522, email: [Karen.Dillard@afit.edu](mailto:Karen.Dillard@afit.edu)

REFEREED JOURNAL PUBLICATIONS

Kirsch, B. R., G. W. Characklis, K. E. M. Dillard, and C. T. Kelley, More efficient optimization of long-term water supply portfolios, *Water Resources Research* **45** (2009), W03414, doi:10.1029/2008WR007018.

**DUCKRO, DONALD E., Lt Col,**

Assistant Professor of Statistics, Department of Mathematics and Statistics, AFIT Appointment Date: 2004 (AFIT/ENC); BChE, University of Dayton, 1984; BS, Louisiana Tech University, 1986; MS, University of Dayton, 1990; PhD, Air Force Institute of Technology, 1999. Lt Col Duckro's research interests include decision theory, particularly as applied to planning and programming; and statistical evaluation of neural networks. His recent research has focused primarily on capacity analysis for Base Realignment and Closure. Lt Col Duckro's previous military assignments involve satellite development, aircraft acquisition, a joint cross-service group for BRAC, and faculty positions at USAFA and NPS.

**FICKUS, MATTHEW C.,**

Assistant 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 pure and applied harmonic analysis, Fourier series, wavelets and frames. Tel. 937-255-3636 x4513 (DSN 785-3636 x4513), email: [Matthew.Fickus@afit.edu](mailto:Matthew.Fickus@afit.edu)

SPONSOR FUNDED RESEARCH PROJECTS

"Functional Analysis for Passive Navigations and Surveillance." Sponsor: AFOSR. Funding: \$40,943.

"Jitter Estimation for Directed Energy Weaponry." Sponsor: 711 HPW/RH. Funding: \$16,756.

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#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Reviewer, *Journal of Fourier Analysis and Applications*.

Fickus, M., "Constructions and existence of tight fusion frames," Norbert Wiener Center Seminar, University of Maryland, College Park, MD, February, 2009.

Fickus, M., "Constructing tight fusion frames," BIRS Workshop on: Frames from first principles: Error correction, symmetry goals, and numerical efficiency, Banff, Alberta, Canada, March, 2009.

Fickus, M., "Constructing tight fusion frames," Analysis Seminar, University of Houston, Houston, TX, March, 2009.

Fickus, M., "Visual navigation via per-pixel classification of terrain," AFOSR Program Review on: Sensing, Surveillance and Navigation, Arlington, VA, June, 2009.

Fickus, M., "Constructing tight fusion frames," Summer Research Institute, Swiss Federal Institute of Technology, Lausanne, Switzerland, June, 2009.

#### **KAZISKA, DAVID M., Maj,**

Maj, Assistant Professor of Statistics, Department of Mathematics and Statistics, AFIT Appointment Date: 2005 (AFIT/ENC); BS, Gannon University, 1987; MA, University of Pittsburgh, 1989; JD, University of Pittsburgh School of Law, 1994; PhD, Florida State University, 2005. Maj Kaziska's research interests are statistical shape analysis with application to gait recognition, functional data analysis, design of experiments, and statistical consulting. In his previous military assignments, he worked in ASC/XR at Wright-Patterson, conducting a concept call addressing future Air Force Special Operations technology needs. He was later assigned to the 422 Test and Evaluation Squadron at Nellis AFB, NV, where he worked as an analyst supporting A-10, F-15E and F-16 operational tests. As of September 2009, Major Kaziska is an operational wargaming analyst at the Lemay Center for Doctrine Development and Education, Maxwell AFB, AL.

#### REFEREED JOURNAL PUBLICATIONS

Bulutoglu, D. A. and D. M. Kaziska, A counterexample to Beder's conjectures about Hadamard matrices *Journal of Statistical Planning and Inference* **139**, No. 9 (2009), 3381-3383.

**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 equations. Tel. 937-255-3636 x4519 (DSN 785-3636 x4519), email: [Alan.Lair@afit.edu](mailto:Alan.Lair@afit.edu)

**REFEREED JOURNAL PUBLICATIONS**

Lair, A. V., Large solutions of mixed sublinear/superlinear elliptic equations, *Journal of Mathematical Analysis and Applications* **346** (2008), 99-106.

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**OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES**

Reviewer, *Mathematical Reviews*

Refereed articles for: *Advanced Nonlinear Studies*, *Journal of Applied Mathematics and Computing*, *Journal of Mathematical Analysis and Applications*, and *Nonlinear Analysis Series A: Theory, Methods & Applications*.

**NOVAK, KYLE A., Lt Col,**

Assistant Professor of Mathematics and Deputy Department Head, Department of Mathematics and Statistics, AFIT Appointment Date: 2006. (AFIT/ENC); BS, University of Wisconsin-Madison, 1993; MA, University of Wisconsin-Madison, 1995; PhD, University of Wisconsin-Madison, 2006. Lt Col Novak's research interests include numerical methods for high frequency limits of quantum phenomena. Lt Col Novak's previous military assignments have been in research and development, signals intelligence, and operational testing. Tel. 937-255-3636 x4635, email: [Kyle.Novak@afit.edu](mailto:Kyle.Novak@afit.edu)

**OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES**

Novak, K. A., "A Semiclassical Transport Model for Quantum Barriers," Workshop on Computational Kinetic Transport and Hybrid Methods, Institute for Pure and Applied Mathematics, April, 2009.

**OXLEY, MARK E.,**

Professor of Mathematics, Department of Mathematics and Statistics, AFIT Appointment Date: 1987 (AFIT/ENC), and Researcher, Sensor Fusion Laboratory, Center for Operational Analysis (COA); BS, Cumberland College, 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, groundwater modeling, wavelet analysis, classifier fusion, sensor fusion and evaluation of fusion techniques, receiver operating characteristic (ROC) curves and manifolds. Dr. Oxley's recent research is funded by AFOSR, AFRL/RB, and NASIC to work on information fusion of ATR systems. Several of his students have written theses and dissertations on optimal remediation of pump-and-treat systems, binaural listening, measuring the capability of artificial neural networks and most recently the fusion of multiple classification systems, the theory of data fusion using category theory, the performance of the fusion of systems, and ROC analysis via ROC curves and ROC manifolds Tel. 937-255-3636 x4515 (DSN 785-3636 x4515), email: [Mark.Oxley@afit.edu](mailto:Mark.Oxley@afit.edu)

**SPONSOR FUNDED RESEARCH PROJECTS**

"Fusion of Disparate Sensor Exploitation Systems." Sponsor: AFOSR. Funding: \$47,200. [COA]

"Fusion of Disparate Sensor Systems." Sponsor: NASIC. Funding: \$20,000. [COA]

"Qualia Exploitation of Sensor Technology for Structural Health Management." Sponsor: AFRL/RB. Funding: \$45,000. [CCR]

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#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Refereed articles for: *Applicable Analysis, Applied Optics, Journal of Sensors, Military Operations Research*.

Reviewer - Proposals: AFOSR.

Reviewer - Conference: International Conference on Information Fusion (FUSION 2009).

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Conference Host: 2009 Waveform Diversity, Design and Optimization Workshop, AFIT, 24-25 Feb 2009.

**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. Dr. Quinn has 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. Tel. 937-255-3636 x4522 (DSN 785-3636 x4522), email: [Dennis.Quinn@afit.edu](mailto:Dennis.Quinn@afit.edu)

**REYNOLDS, DANIEL E.,**

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

**SCHUBERT, CHRISTINE M.,**

IPA, Visiting Assistant Professor of Statistics, Department of Mathematics and Statistics, AFIT Appointment Date: 1 Jul 2009 (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's research interests include classification techniques, ROC curve theory and extensions, information fusion, longitudinal modeling, survey design and analysis, and general biostatistics. Dr Schubert's current research is in evaluating the performance of classification systems and fused systems via ROC methodology as well as epidemiological applications to disease prediction and medical diagnostics. Tel. 937-255-3636 x4549 (DSN 785-3636 x4549), email: [christine.schubert.ctr@afit.edu](mailto:christine.schubert.ctr@afit.edu)

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Associate Professor of Statistics, Department of Mathematics and Statistics, AFIT Appointment Date: 1998 (AFIT/ENC); BS, University of Tampa, 1990; MAS, 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 (DSN 785-3636 x4540), email: [Edward.White@afit.edu](mailto:Edward.White@afit.edu)

**REFEREED JOURNAL PUBLICATIONS**

Salaverry, J. A. and E. D. White, Improving procurement through regression analysis: A case study of predicting Argentine jet fuel prices, *Journal of Public Procurement* **9**, No. 1 (2009), 1-16.

**OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES**

Co-Editor, *Journal of Cost Analysis and Parametrics*

**WOOD, AIHUA W.,**

Professor of Mathematics, Department of Mathematics and Statistics, AFIT Appointment Date: 1994 (AFIT/ENC); BS, Beijing 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 Boltzman equations. Tel. 937-255-3636 x4272 (DSN 785-3636 x4272), email: [Aihua.Wood@afit.edu](mailto:Aihua.Wood@afit.edu)

**REFEREED JOURNAL PUBLICATIONS**

Wood, A. W. and J. Fleming, EM scattering from bodies of revolution using the locally corrected Nystrom method, *ACES Journal* **23**, No. 3 (2008), 317-322.

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**OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES**

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Wood, A. W., "Helmholtz equation for over-filled cavities." PIERS 2009, Beijing, China, March, 2009.

**WRIGHT, SAMUEL A., Maj,**

Assistant Professor of Statistics, Department of Mathematics and Statistics, AFIT Appointment Date: 2004 (AFIT/ENC); BS, United States Air Force Academy, 1989; MS, Air Force Institute of Technology, 1995; PhD, Air Force Institute of Technology, 2001. Maj Wright's research interests include statistics, gait recognition, model validation, and pattern recognition. Tel. 937-255-3636 x4549 (DSN 785-3636 x4549), email: [Samuel.Wright@afit.edu](mailto:Samuel.Wright@afit.edu)



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<b>5.5.1</b>	<b><u><a href="#">DOCTORAL DISSERTATIONS</a></u></b>	<b>148</b>
<b>5.5.2</b>	<b><u><a href="#">MASTER'S THESES</a></u></b>	<b>148</b>
<b>5.5.3</b>	<b><u><a href="#">GRADUATE RESEARCH PAPERS</a></u></b>	<b>150</b>
<b>5.5.4</b>	<b><u><a href="#">FACULTY RESEARCH OUTPUT</a></u></b>	<b>152</b>

### 5.5.1. DOCTORAL DISSERTATIONS

KENNEDY, KEVIN T., *Synthesis, Interdiction, and Protection of Layered Networks*. AFIT/DS/ENS/09-01. Faculty Advisor: Dr. Richard F. Deckro. Sponsor: N/A.

LEINART, JAMES A., *Characterizing and Detecting Unrevealed Elements of Network Systems*. AFIT/DS/ENS/08-01W. Faculty Advisor: Dr. Richard F. Deckro. Sponsor: N/A.

TURNBAUGH, MICHAEL A., *A Hybrid Templated-Based Composite Classification System*. AFIT/DS/ENS/08-04. Faculty Advisor: Dr. Kenneth Bauer, Jr. Sponsor: AFOSR & ACC.

### 5.5.2. MASTER'S THESES

ARENDT, CHRISTOPHER D., *Adaptive Pareto Set Estimation for Stochastic Mixed Variable Design Problems*. AFIT/GOR/ENS/09-01. Faculty Advisor: Dr. James W. Chrissis. Sponsor: N/A.

ARSLAN, OKAN, *Developing a Tool for the Location Optimization of the Alert Aircraft with Changing Threat Anticipation*. AFIT/GOR/ENS/09-02. Faculty Advisor: Dr. James T. Moore. Sponsor: TuAF.

BLACKMAN, JOE M., *Quantification of Mandatory Sustainment Requirements*. AFIT/GLM/ENS/09M-01. Faculty Advisor: Dr. Alan W. Johnson. Sponsor: AFELM.

BUYUKGURAL, FERIT, *A 4-Step Process Evaluation Model to Assess the Success of Performance Based Logistics Contracts*. AFIT/GLM/ENS/09-2. Faculty Advisor: Dr. Martha Cooper. Sponsor: N/A.

CHANEY, ANDREW D., *Project Scheduling to Maximize Positive Impacts of Reconstruction Operations*. AFIT/GOR/ENS/09-03. Faculty Advisor: Dr. Richard F. Deckro. Sponsor: USCENTCOM.

CHO, MIN CHEOL, *An Analysis of Class II Supplies Requisitions in the Korean Army's Organizational Supply*. AFIT/GLM/ENS/09-04. Faculty Advisor: Lt Col Bradley E. Anderson. Sponsor: ROKA.

COHEN, ALLEN N., *Examining Split-Plot Designs for Developmental and Operational Testing*. AFIT/GOR/ENS/09-04. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: AFMC/46 TW.

DAVIS, MATTHEW T., *Using Multiple Robust Parameter Design Techniques to Improve Hyperspectral Anomaly Detection Algorithm Performance*. AFIT/GOR/ENS/09-05. Faculty Advisor: Dr. Kenneth W. Bauer. Sponsor: N/A.

GABER, HARVEY S., *Waste Vegetable Oil as an Alternative Fuel for Diesel Vehicles*. AFIT/GEM/ENS/09-01. Faculty Advisor: Lt Col Bradley E. Anderson. Sponsor: ASC.

GEYER, ANDREW J., *Operations-Focused Optimized Theater Weather Sensing Strategies Using Preemptive Binary Integer Programming*. AFIT/GOR/ENS/09-06. Faculty Advisor: Maj Shane N. Hall. Sponsor: AFSOC.

GULER, CAGLAR UTKU, *Ohio River Denial as a Transportation Corridor and Its Economic Impacts on the Energy Industry*. AFIT/GLM/ENS/09-5. Faculty Advisor: Dr. Alan W. Johnson. Sponsor: N/A.

HEIMAN, THEODORE K., *Simulation Modeling of the C-5 Galaxy High Velocity Regionalized Isochronal (HVRISO) Inspection Concept*. AFIT/GLM/ENS/09-6. Faculty Advisor: Dr. Alan W. Johnson. Sponsor: HQ AMC.

HOLZMANN, TIMOTHY, *Probabilistic Estimation of Rare Random Collisions in 3-Space*. AFIT/GOR/ENS/09-07. Faculty Advisor: Dr. Jeffery Cochran. Sponsor: Air University.

LANE, CRAIG A., *Data Quality-A Key to Successfully Implementing ECSS*. AFIT/GLM/ENS/09-07. Faculty Advisor: Dr. Jeffrey Ogden. Sponsor: HQ USAF/A4IT.

LEGGIO, DEREK A., *Examining Methods to Reduce Wind Tunnel Test Data Requirements Using the Design of Experiments (DOE)*. AFIT/GOR/ENS/09-08. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: AEDC/XP.

LIM, CHANGWOOK, *Combat Identification Modeling Using Neural Network Techniques*. AFIT/GOR/ENS/09-09. Faculty Advisor: Dr. Kenneth W. Bauer. Sponsor: HQ ACC.

MILLER, MICHAEL K., *Exploitation of Intra-Spectral Band Correlation for Rapid Feature Selection and Target Identification in Hyperspectral Imagery*. AFIT/GOR/ENS/09-10. Faculty Advisor: Dr. Kenneth W. Bauer. Sponsor: N/A.

MOLINA, CARLOS ALBERTO, *Reusable Launch Vehicle Design Implications for Regeneration Time*. AFIT/GLM/ENS/09-08. Faculty Advisor: Dr. Alan W. Johnson. Sponsor: N/A.

NANCE, ROBERT L., *An Advanced Tabu Search Approach to Solving the Mixed Payload Airlift Load Planning Problem*. AFIT/GOR/ENS/09-11. Faculty Advisor: Maj August G. Roesener. Sponsor: HQ AMC.

RICHARDS, CHRISTOPHER D., *Creating Multi Objective Value Functions From Non-Independent Values*. AFIT/GOR/ENS/09-12. Faculty Advisor: Dr. Jeffrey Weir. Sponsor: JIEDDO.

SAGLAM, OMER, *Forecasting USAF JP-8 Fuel Needs*. AFIT/GLM/ENS/09-9. Faculty Advisor: Lt Col Bradley E. Anderson. Sponsor: HW USAF.

SARIKAYA, NEBI, *Determining the Orbit Locations of Turkish Airborne Early Warning and Control Aircraft Over the Turkish Air Space*. AFIT/GOR/ENS/09-14. Faculty Advisor: Dr. James T. Moore. Sponsor: TuAF.

SHILLAND, GLEN R., *Host-Based Multivariate Statistical Computer Operating Process Anomaly Intrusion Detection System (PAIDS)*. AFIT/GOR/ENS/09-15. Faculty Advisor: Dr. Kenneth W. Bauer. Sponsor: AFRL/RV.

SPRAGUE, THOMAS M., *Education and Training as Part of an Expeditionary Combat Support System Implementation Strategy*. AFIT/GLM/ENS/09-10. Faculty Advisor: Dr. Jeffrey Ogden. Sponsor: HQ USAF/A4IT.

VAN KUIKEN, JOSEPH A., *Using Agent-Based Modeling to Evaluate UAS Behaviors in a Target-Rich Environment*. AFIT/GOR/ENS/09-16. Faculty Advisor: Dr. J.O. Miller. Sponsor: HQ USAF.

WALLER, BRIAN D., *Evaluation of Air Force Aircraft Maintenance Metrics for Integration into the Expeditionary Combat Support System*. AFIT/GLM/ENS/09-13. Faculty Advisor: Dr. Jeffrey Ogden. Sponsor: HQ USAF/A4IT.

WILLY, CHRISTINA J., *Robust Sensitivity Analysis for the Joint Improvised Explosive Device Defeat Organization (JIEDDO) Proposal Selection Model*. AFIT/GOR/ENS/09-17. Faculty Advisor: Dr. Kenneth W. Bauer. Sponsor: JIEDDO.

WOODS, FRANKIE L., *A Cost Assessment of the Dayton Public Schools Vehicle Routing Problem*. AFIT/GOR/ENS/09-18. Faculty Advisor: Dr. Jeffrey Weir. Sponsor: Dayton Public Schools Transportation Center.

### 5.5.3. GRADUATE RESEARCH PAPERS

BURGESS, JAMES E., *Fuel Savings of Removing the C-130 External Tanks*. AFIT/IMO/ENS/09-1. Faculty Advisor: Dr. William A. Cunningham. Sponsor: HQ AMC.

ESTRIDGE, CHRISTOPHER J., *Material Management of Medical-Surgical Items at Military Healthcare Facilities*. AFIT/ILS/ENS/09-01. Faculty Advisor: Lt Col Pamela S. Donovan. Sponsor: AFMOA/SGAL.

FINO, STEVEN A., *The Effect of Pilot Experience and Training on Air Combat in an Advanced Electronic Attack Environment: A Quantitative Analysis*. AFIT/IOA/ENS/09-01. Faculty Advisor: Dr. Raymond Hill. Sponsor: JEPAC.

HAUCK, DAVID R., *Reengineering JSUPT*. AFIT/IMO/ENS/09-2. Faculty Advisor: Dr. William A. Cunningham. Sponsor: HQ AETC.

LANIER, CHRISTOPHER M., *Implementing Supply Chain Management: Synchronizing Cargo Movement From the United States to Iraq*. AFIT/IMO/ENS/09-3. Faculty Advisor: Maj Ben Skipper. Sponsor: HQ AMC.

LEW, SCOTT S., *Analysis of Civil Reserve Airfleet Participation*. AFIT/IMO/ENS/09-4. Faculty Advisor: Lt Col Pamela S. Donovan. Sponsor: HQ AMC.

LILJENSTOLPE, MATTHEW, *Single-Pass Serial Scheduling Heuristic for Eglin AFB Range Services Division Schedule*. AFIT/IOA/ENS/09C-02. Faculty Advisor: Dr. James T. Moore. Sponsor: HQ AFMC.

LUX, BARTON S., *Denton Cargo Process*. AFIT/IMO/ENS/09-5. Faculty Advisor: Dr. William A. Cunningham. Sponsor: USTRANSCOM.

MARTIN, MARGARET C., *Rated Staff Management*. AFIT/IMO/ENS/09-6. Faculty Advisor: Maj Ben Skipper. Sponsor: HQ USAF.

MATHERNE, RAY P., *Fuel Saving Though Aircraft Modification: A Cost Analysis*. AFIT/IMO/ENS/09-7. Faculty Advisor: Dr. James T. Moore. Sponsor: HQ AMC.

MAZZARA, DAVID J., *Automated Air Refueling Cost Benefit Analysis*. AFIT/IMO/ENS/09-8. Faculty Advisor: Dr. James T. Moore. Sponsor: HQ AMC.

MORGAN, ERIC E., *Operation Team Spirit: Program Review and Analysis*. AFIT/ILS/ENS/09-03. Faculty Advisor: Lt Col Stephen P. Chambal. Sponsor: HQ AFMC.

NAYLOR, RANDY S., *Improving the En Route Mobility System*. AFIT/IMO/ENS/09-9. Faculty Advisor: Dr. William A. Cunningham. Sponsor: HQ USAF/CVAQ.

NEWLIN, JULIE S., *Minimizing the Human Capital Aspect of Productivity Disruption During Implementation of an Enterprise Resource Planning (ERP) System*. AFIT/ILS/ENS/09C-02. Faculty Advisor: Dr. Jeffrey A. Ogden. Sponsor: HQ USAF/A4IT.

NICHOLSON JR., JAMES B., *Bio-Fuels for Air Mobility Command Assets: The Way Ahead*. AFIT/IMO/ENS/09-10. Faculty Advisor: Lt Col Bradley E. Anderson. Sponsor: HQ AMC.

O'BRIEN, PATRICK H., *TWCF for Tankers*. AFIT/IMO/ENS/09-11. Faculty Advisor: Dr. James T. Moore. Sponsor: HQ AMC.

PARDEE, BRIAN D. and WALLS, DANIEL P., *Third Party Targeting: A Quantitative Analysis Using BRAWLER*. AFIT/IOA/ENS/09-09C-04. Faculty Advisor: Dr. J.O. Miller. Sponsor: NASIC.

REAGAN, KIRK L., *C-130 Airdrop/Formation Crew Qualifications*. AFIT/IMO/ENS/09-12. Faculty Advisor: Dr. James T. Moore. Sponsor: HQ AMC.

REIMAN, ADAM D., *Hydrogen Aircraft Technology*. AFIT/IMO/ENS/09-13. Faculty Advisor: Lt Col Bradley E. Anderson. Sponsor: HQ AMC.

RIVERA, FRANCISCO, *Last Tactical Mile Airlift Requirements/Mix of Assets (QDR)*. AFIT/IMO/ENS/09-14. Faculty Advisor: Dr. James T. Moore. Sponsor: SAF.

ROWE, RYAN L., *Optimal CV-22 Centralized Intermediate Repair Facility Locations and Parts Repair*. AFIT/ILS/ENS/09C-04. Faculty Advisor: Dr. William A. Cunningham. Sponsor: AFSOC.

STEYAERT, TRACE B., *Developing Qualified Logistics Readiness Officers Within Air Combat Command*. AFIT/ILS/ENS/09C-05. Faculty Advisor: Maj Joseph B. Skipper. Sponsor: HQ ACC.

TRINKLEIN, ALLISON M., *Reengineering the Tanker Allocation Process*. AFIT/IMO/ENS/09-15. Faculty Advisor: Dr. Alan Heminger. Sponsor: HQ AMC.

ULMER, THOMAS R., *Adaptive Logistics Network for AFRICOM*. AFIT/IMO/ENS/09-16. Faculty Advisor: Dr. James T. Moore. Sponsor: AFRICOM.

VAN DEN TOP, TRICIA A., *Small Business Programs: Benefits, Barriers, Bridges and Critical Success Factors*. AFIT/ILS/ENS/09C-06. Faculty Advisor: Dr. Jeffrey A. Ogden. Sponsor: HQ PACAF.

WALLS, DANIEL P., See PARDEE, BRIAN D.

#### **5.5.4. FACULTY RESEARCH OUTPUT**

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

##### **ANDERSON, BRADLEY E.,**

Assistant Professor of Logistics Management, Department of Operational Sciences, AFIT Appointment Date: 2002 AFIT/ENS); Center for Operational Analysis (COA), BS, Meteorology, University of Wisconsin - Madison, 1990; MS, Logistics Management, Air Force Institute of Technology, 1996; MB, Business, Indiana University – Bloomington, 2002; PhD, Business, Indiana University - Bloomington, 2002. Maj Anderson's research interests include repairable inventory management, mixed integer programming, network models, supply chain management, and evolutionary algorithms.

##### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Pursuing Waste Vegetable Oil as an Alternative Fuel, Harvey Gaber, Bradley Anderson, Production and Operations Management Society (POMS) Annual Conference, Orlando, FL, May 1-4, 2009. [COA]

##### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Division Chief, Logistics Management – Oversee all aspects of course scheduling and program development, faculty hiring, and student development.

Past Faculty Council President and member of the Faculty Executive Committee.

Member of Higher Learning Council (HLC) Steering Committee for AFIT reaccreditation.

The Forecasting Challenge – Practical Uses and Limitations, By Bradley Anderson, presented to APICS Michiana Chapter, at South Bend, IN, Feb 10, 2009.

##### **BAUER, KENNETH W.,**

Professor of Operations Research, Dept of Operational Sciences, AFIT Appointment Date: 1996 (AFIT/ENS); Center for Operational Analysis (COA), BS, Miami University (Ohio), 1976; MEA, University of Utah, 1980; MS, Air Force Institute of Technology, 1981; PhD, Purdue University, 1987. Dr. Bauer's research interests include the statistical aspects of simulation, design of experiments, neural networks, and multivariate statistics. Tel. 937-255-6565 x4367 (DSN 785-6565 x4367), email: [Kenneth.Bauer@afit.edu](mailto:Kenneth.Bauer@afit.edu)

##### SPONSOR FUNDED RESEARCH PROJECTS

"Advanced Research in Automatic Target Recognition." Sponsor: NASIC. Funding: \$119,170. [COA]

"AFIT Analysis Support to JIEDDO, Task 1b." Sponsor: JIEDDO. Funding: \$129,186. [COA]

"Hyperspectral Target Detection." Sponsor: AS&T. Funding: \$74,298. [COA]

"Sensor Fusion for Automatic Target Recognition." Sponsor: AFRL/RV. Funding: \$50,000. [COA]

##### REFEREED JOURNAL PUBLICATIONS

Loeffelholz, Bernard; Bednar, Earl; and Bauer, Kenneth W. "Predicting NBA Games Using Neural Networks," *Journal of Quantitative Analysis in Sports*, Vol. 5, Issue 1, Article 7, 2009. [COA]

Smetek, T.E., K.W. Bauer, "A Comparison of Multivariate Outlier Detection Methods for Finding Hyperspectral Anomalies," *Military Operations Research*, Volume 13, No. 4, 2008, pp. 19-44. [COA]

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Christine M. Schubert, Mark E. Oxley, and Kenneth W. Bauer, Jr., "Bounds on the ROC Curves from Fused Correlated ATR Systems," Proceedings of SPIE, Signal Processing, Sensor Fusion, and Target Recognition XVIII, Editor: Ivan Kadar, Vol. 7336, paper 21, Orlando FL, 14-16 April 2009. [COA]

Steven N. Thorsen, Seth A. Wagenman, Mark E. Oxley, and Kenneth W. Bauer, "A Risk-Based Comparison of Classification Systems," Proceedings of SPIE, Signal Processing, Sensor Fusion, and Target Recognition XVIII, Editor: Ivan Kadar, Vol. 7336, paper 31, Orlando FL, 14-16 April 2009. [COA]

Ryer, David M. and Kenneth W. Bauer, "Enhanced Hyperspectral Face Recognition," Intelligent Engineering Systems through Artificial Neural Networks Volume 19: Computational Intelligence in Architecting Complex Engineering Systems, ASME Press, New York, 2009. [COA]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Operations Research PhD program Director.

Member of PhD Committee at Wright State University: Student, Priya Ganapathy. Dissertation Working Title: Design, development and assessment of a flexible framework for versatile target detection in imagery.

QUEST member: Dr. Steve Rogers, Senior Scientist for Sensor Fusion and ATR at AFRL/RY has formed a QUEST advisory board to develop a new way to approach pattern recognition problems. The members are Dr. Rogers, Dr. Matt Kabrisky (AFIT EE emeritus professor), Dr. Oxley (Math Dept.), and Dr. Bauer.

#### **CHAMBAL, STEPHEN P., Lt Col,**

Associate Professor of Operations Research, Department of Operational Sciences, AFIT Appointment Date: 1999 (AFIT/ENS); Director, Center for Operational Analysis (COA), BS, United States Air Force Academy, 1993; MS, Arizona State University, 1995; PhD Arizona State University, 1999. Lt Col Chambal's research interests include discrete event simulation, decision analysis, and reliability, maintainability and availability analysis. Tel. 937-255-6565 x4538 (DSN 785-6565 x4538), email: [Stephen.Chambal@afit.edu](mailto:Stephen.Chambal@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

"AFIT/ENS Support to the Air Force Technical Applications Center." Sponsor: AFTAC. Funding: \$75,000. [COA]

"COA Support." Sponsor: 711 HPW/RH. Funding: \$20,000. [COA]

"Research, Analysis, and Transition Support to the Air Force Global Logistics Support Center." Sponsor: AFGLSC. Funding: \$90,272. [COA]

#### SPONSOR FUNDED EDUCATIONAL PROJECTS

"Test and Evaluation Program Sponsorship." Sponsor: 746 TS. Funding: \$20,000. [COA]

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

A Framework for Improving Experimental Designs and Statistical Models for T&E, Hill, Chambal, AF T&E Days, Feb 2009. [COA]

Center for Operational Analysis and TECP, Hill, Chambal, AF/TE Annual Conference, Jan 2009. [COA]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Associate Editor – MORS.

Director, Center for Operational Analysis.

#### **CHRISSIS, JAMES W.,**

Associate Professor of Operations Research, Department of Operational Sciences, AFIT Appointment Date: 1987 (AFIT/ENS); BS, University of Pittsburgh, 1975; MS, Virginia Polytechnic Institute and State University, 1977; PhD, Virginia Polytechnic Institute and State University, 1980. Dr. Chrissis' research interests include engineering optimization, mathematical programming, simulation, stochastic systems, and industrial engineering. Dr. Chrissis has been a member of the faculties of Virginia Tech and the University of South Florida. He is a member of the Institute for Operations Research and Management Sciences (INFORMS), The Society for Industrial and Applied Mathematics (SIAM), the Military Operations Research Society (MORS), The American Institute for Aeronautics and Astronautics (AIAA), and Sigma Xi. Tel. 937-255-3636 x4606 (DSN 785-3636 x4606), email: [James.Chrissis@afit.edu](mailto:James.Chrissis@afit.edu)

#### REFEREED JOURNAL PUBLICATIONS

Mark A. Abramson, Charles Audet, James W. Chrissis, Jennifer Walston, "Mesh Adaptive Direct Search Algorithms for Mixed Variable Optimization," Optimization Letters, Vol. 3, No. 1, pp. 35-47, January 2009. [COA]

Todd A. Sriver, James W. Chrissis, Mark A. Abramson, "Pattern Search Ranking and Selection Algorithms for Mixed Variable Simulation-Based Optimization," European Journal of Operational Research, Vol. 198, No. 3, pp. 878-890, November 2008. [COA]

J. Todd Hamill, Richard F. Deckro, Robert F. Mills, and James W. Chrissis, "Reach-Based Assessment of Position," Military Operations Research, Vol. 13, No.4, pp. 59-78, 2008. [COA]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

President-Elect Cincinnati-Dayton Chapter of INFORMS.

Reviewed papers submitted for the April 2009 AIAA SDM Conference/MDO Specialist Conference in Palm Springs, CA.

Reviewed papers for the MDO sessions at the January 2009 AIAA Aerospace Sciences Meeting in Orlando, FL.

MDO Technical Committee Secretary.

Member of the MDO/TC Education Subcommittee.

Elevated to Senior Member of AIAA.



**COCHRAN, JEFFERY K.,**

Professor of Operations Research and Head, Department of Operational Sciences, AFIT Appointment Date: 2007 (AFIT/ENS); BSE, Purdue University, 1973; MSNE, Purdue University, 1976; MSIE, Purdue University, 1982; PhD, Purdue University, 1984. Dr. Cochran's research interests include applied probability, queuing and queuing networks, and heuristic optimization of stochastic models particularly in high technology entity flow systems. Tel. 937-255-3636 x4521 (DSN 785-3636 x4521), email: [Jeffery.Cochran@afit.edu](mailto:Jeffery.Cochran@afit.edu).

**REFEREED JOURNAL PUBLICATIONS**

Cochran, J.K., Kokangul, A., and Khaniyev, T., "Stochastic Approximations for Optimal Buffer Capacity of Many-Station Production Lines," International Journal of Mathematics in Operational Research 1:1/2, pp. 211-227 (2009). [COA]

Cochran, J.K. and Roche, K.T., "A Multi-class Queuing Network Analysis Methodology for Improving Hospital Emergency Department Performance," Computers and Operations Research 36:5, pp. 1497-1512 (2009). [COA]

**REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW**

Broyles, J.R. and Cochran, J.K., "A Markov Chain Methodology for Predicting Hospital Inpatient Census," IIE Industrial Engineering Research Conference, pp. 832-827, Miami, FL (2009). [COA]

Cochran, J.K. and Roche, K.T., "Determining Bed Capacities Using Queuing Theory: A Whole Hospital View," IIE Industrial Engineering Research Conference, Invited Paper, pp. 856-861, Miami, FL (2009). [COA]

**BOOKS AND CHAPTERS IN BOOKS**

Burdick, T.L., Cochran, J.K., Andrews, R.A., Bucco, M.E., Broyles, J.R., and Roche, K.T., "Door to Doc Toolkit: Planning ED Capacity for Delivering Safe Care, Managing ED and Hospital Systems, Chapter 8, Shiver and Eitel editors, Taylor and Francis (2009). [COA]

Cochran, J.K. and Lewis, T.P., "Computing Small-Fleet Aircraft Availabilities Including Redundancy and Spares," Handbook of Military Industrial Engineering, Chapter 13, Badiru and Thomas editors, Taylor and Francis (2009). [COA]

**OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES**

Editorial Board, Computers in Industry.

Editorial Board, Journal of Design and Manufacturing Automation.

Editorial Board, International Journal of Simulation and Process Modeling.

Editorial Board, International Journal of Industrial and Systems Engineering.

Editorial Board, International Journal of Mathematics in Operational Research.

AFIT, Department of Operational Sciences, Head (2008-2009).

Senior Member of the Society for Computer Simulation.

Senior Member of the Institute of Industrial Engineers.

**COOPER, MARTHA C.,**

Visiting Professor of Logistics Management, Department of Operational Sciences, AFIT Appointment Date: 2006 (AFIT/ENS); BS, Math/Computer Science, Purdue University, 1968; MS Industrial Administration, Purdue University, 1968; Ph.D., Business (Marketing, Logistics), The Ohio State University, 1982. Professor Cooper's research interests include supply chain management, partnership and other inter-firm relationships, the role of customer service in corporate strategy, international logistics, and career patterns of women in logistics. She has co authored three books, Customer Service: A Management Perspective, Partnerships in Providing Customer Service: A Third Party Perspective, and Strategic Planning for Logistics. Professor Cooper has over one hundred publications, including two best paper awards. Tel. 937-255-3636 x4708 (DSN 785-3636 x4708).

**REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW**

"Assessing Performance-Based Logistics Contract Results," Ferit Buyukgural, Martha Cooper, and Jeffrey Ogden, Productions and Operations Management Society (POMS) annual conference, Orlando, May 1-4, 2009. [COA]

"Career Patterns of Women in Logistics," Martha Cooper and Jan Macauley, Supply Chain and Logistics Canada Annual Conference, Toronto, April 28-29, 2009. [COA]

"Assessment of Large Aircraft Maintenance Inspection Strategies," Alan Johnson, Theodore Heiman, Martha Cooper, and Raymond Hill, Midwestern Decision Sciences Institute Conference, Oxford OH, 16-18 April 2009. [COA]

"Modeling the C-5 Isochronal Inspection Process," Martha Cooper, Theodore Heiman, Alan Johnson, Raymond Hill, Military Applications, INFORMS, Washington, D. C., Oct 12-15, 2008. [COA]

"2008 Career Patterns of Women in Logistics," Martha C. Cooper, Deborah Hurst, Alan Law, Julie Lockwood, John Santosa, and Didem Gurer, Council of Supply Chain Management Professionals Annual Conference, October 5-8. [COA]

Buyukgural, F., Cooper, M. and Ogden, J.A. (2009) "Assessing Performance-Based Logistics Contract Results," presented at the 20th Annual Conference of the Production and Operations Management Society, Orlando, Florida, May 2009. [COA]

Midwestern Decision Sciences Institute Conference, 16-18 April 2009, Oxford OH (with T. Heiman, M. Cooper, and R. Hill), "Assessment of Large Aircraft Maintenance Inspection Strategies." [COA]

**OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES**

"Logistics Ph.D. Hiring Survey," Martha C. Cooper, distributed at the Logistics Educators Conference, and at the doctoral consortium; 2008 survey distributed at Denver meeting and provided on Fisher College web site.

Attended two meetings called by J4 LTG Gainey of the Defense Logistics Education Executive Workshop, NDIA, Washington, DC, October 3 2008 and April 30 2009, representing Ohio State University.

**CUNNINGHAM, WILLIAM A.,**

Professor of Logistics Management, Department of Operational Sciences, AFIT Appointment Date: 1994 (AFIT/ENS); BS, Business Administration, Missouri Southern State College, 1976; MS, Economics, Oklahoma State University, 1979; PhD, Economics, University of Arkansas, 1986. Dr. Cunningham's research interests include transportation, strategic mobility, activity-based costing, lean, six sigma, theory of constraints, logistics management, public policy analysis, privatization, third-party logistics, international logistics, and international trade. Tel. (937) 255-6565 x4283 (DSN 785-6565 x4283), email:

[William.Cunningham@afit.edu](mailto:William.Cunningham@afit.edu)

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

"Aggregating Aircraft Mission Capable Rates to Determine Total Aircraft Availability," INFORMS Annual Conference, October 13, 2008, Washington, DC. With John Johnson and Alan Johnson. [COA]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Book Reviewer for Army Logistician.

Editorial Review Board – Air Force Journal of Logistics.

Editorial Review Board - Journal of Transportation Management.

National Testing Committee - American Society of Transportation & Logistics.

#### **DECKRO, RICHARD F.,**

Professor of Operations Research, Department of Operational Sciences, AFIT Appointment Date: 1994 (AFIT/ENS); BSIE, State University of New York at Buffalo, 1972; MBA, Kent State University, 1973; DBA, Kent State University, 1976. Dick's research, teaching and consulting interests are in the areas of information operations and information assurance, reconstruction and stabilization, measures of effectiveness and assessment, behavioral modeling, social networks, irregular warfare, applied mathematical programming and optimization, project and program management, campaign modeling, technology selection and management, scheduling, network models, advanced manufacturing methods, multi-criteria decision making, and decision analysis. Dick is the Editor of *Military Operations Research* and a Fellow of the *Military Operations Research Society*. Tel. 937-255-6565 x4325 (DSN 785-6565 x4325), <http://en.afit.edu/ens/deckro/>, email: [Richard.Deckro@afit.edu](mailto:Richard.Deckro@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

"AFIT Analysis Support to JIEDDO, Task 2b." Sponsor: JIEDDO. Funding: \$249,260. [COA]

#### REFEREED JOURNAL PUBLICATIONS

J. Todd Hamill, Richard F. Deckro, Robert F. Mills, and James W. Chrissis, "Reach-Based Assessment of Position," *Military Operations Research*, Vol. 13, No 4, (2008), pp. 59-78.

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Maj Kevin T. Kennedy, Richard F. Deckro, James T. Moore, & Kenneth M. Hopkinson, "Targeting Closeness of Human Networks," to be presented at the 77th MORS Symposium, Ft Leavenworth KS, June 2009 in WG 8, Information Operations and WG 32, Warfighter Performance & Social Science Methods.

Maj Kevin T. Kennedy, Richard F. Deckro, James T. Moore, & Kenneth M. Hopkinson, "Nodal Interdiction," to be presented at the 77th MORS Symposium, Ft Leavenworth KS, June 2009 in WG 8, Information Operations and WG 1, Strategic Operations.

Kevin Kennedy, Richard F. Deckro & James T. Moore, "Cost and Robustness in Layered Infrastructure Networks," INFORMS Washington DC, October 2008.

James A. Leinart & Richard F. Deckro, "Determining Social Influence Network Structures," INFORMS, Washington DC, October 2008.

## BOOKS AND CHAPTERS IN BOOKS

Richard F. Deckro, James T. Moore, Michael L. Fredley, Jack A. Jackson, Michael J. Artelli, and John C. Van Hove, "Joint and Multinational Campaign Planning: A Project/Program Management Approach", Handbook of Military Industrial Engineering, ed. by Adedeji B Badiru and Marlin U. Thomas, (Taylor and Francis Publishing), (2009), pp. 16-1 – 16-13.

## OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Judge, Systems Engineering Senior Capstone Conference, USMA, 30 April, 2009.

Editor, Military Operations Research.

Chair, Military Applications Society Awards Committee (2008).

Reviews - Journal of Engineering Manufacture.

Reviews - Journal of Risk and Reliability.

Reviews - Military Operations Research Society.

At the AFOSR Program Director's request, attended MINERVA Research Initiative (MRI) Initial Kickoff Meeting for "Emotion and Intergroup Relations," held at 711 HPW Headquarters, WPAFB on 28 May 2009.

At the AFOSR Program Director's request, attended The Annual Review for the FY-05 MURI "Computational Models for Belief Revision, Group Decision-Making, & Cultural Shifts" held at MIT on 23 -25 April 2009.

Analysis Team Consultant, Schriever V Analysis Team, (2009).

Participant, MORS Irregular Warfare II Workshop, 4-6 February 2009, MacDill AFB, FL.

Participant, MORS Cyber & Networking Workshop, 28-30 October 2008, Chantilly, VA.

Member of the Behavioral Influence Analysis Working Group for the Human Factors for Homeland and National Security (HFHNS) Subcommittee of the National Science and Technology Council (NSTC) Committee on Homeland and National Security (SHNS).

Member, MORS Publication Committee.

Member, Peacekeeping and Stability Operations Institute Academic Consortium.

Member, Advisory Group on Applications, GMU/CMU MURI "Computational Modeling of Cultural Dimensions in Adversary Modeling."

Invited participant, NDU-CTNSP Conference: "COCOM Requirements for Human Social and Cultural Behavior (HSCB) Modeling" held 8-10 June at National Defense University.

## **DONOVAN, PAMELA S., Lt Col,**

Assistant Professor of Logistics Management, Department of Operational Sciences, AFIT Appointment Date: 2006 (AFIT/ENS); BS, Kent State University, 1986; MS, Air Force Institute of Technology, 1996; PhD, University of Maryland, 2006. Lt Col Donovan's research interests include inventory modeling, distribution processes, supply chain integration, and transportation. Tel. 937-255-3636 x4510 (DSN 785-3636 x4510), email: [Pamela.Donovan@afit.edu](mailto:Pamela.Donovan@afit.edu)

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Estridge, Christopher and Pamela S. Donovan, "Material Management at Military Healthcare Facilities," Production and Operations Management Society Annual Conference, Orlando, FL, 8 May 2009. [COA]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Panel member on Supply Chain and Logistics Research in the Public Sector at Production and Operations Management Society Annual Conference, Orlando, FL, 8 May 2009.

Deputy Department Head.

Program Manager, ASAM.

Journal Referee for Transportation Journal. Paper # 2009-016a titled "The Role of Technology Acceptance in Industrial Customers' Satisfaction with Logistics Services."

#### **HALL, SHANE N., Maj,**

Assistant Professor of Operations Research, Department of Operational Sciences, AFIT Appointment Date: 2006 (AFIT/ENS); BS, Mathematics, Brigham Young University, 1997; MS, Operations Research, Air Force Institute of Technology, 2000; PhD, Industrial Engineering, University of Illinois at Urbana-Champaign, 2006. Maj Hall's research interests include linear and integer optimization, dynamic programming approximation algorithms and heuristics with applications to military and health care problems. Tel. 937-255-3636 x4264 (DSN 785-3636 x4624), email: [Shane.Hall@afit.edu](mailto:Shane.Hall@afit.edu)

#### REFEREED JOURNAL PUBLICATIONS

Hall, S.N., Jacobson, S.H., Sewell, E.C., 2008, "An Analysis of Pediatric Vaccine Formulary Selection Problems," Operations Research, 56(6), 1348-1365. [COA]

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Geyer, A.J., Hall, S.N., and Moore, J.T., 2009, "Operations-focused Optimized Theater Weather Sensing Strategies Using Preemptive Binary Integer Programming," 77th Military Operations Research Society Symposium, United States Army Command and General Staff College, Fort Leavenworth, KS, June 16-18, 2009. [COA]

Williamson, D.L., Hall, S.N., Anderson, B.E., and Johnson, A.W., 2008, "Inland Troop Resupply Without a Road or Runway: Airdrop Solutions Including High-Altitude Precision Systems," INFORMS Annual Meeting, Washington, DC, October 12-15, 2008. [COA]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Reviewer for journal Military Operations Research.

Operations Research Division Chief (course planning/scheduling, curriculum improvement, coordinate faculty meetings, assist with Dept admin, etc.).

Scholarship Selection Committee, Seth Bonder Scholarship, Healthcare Application Section, INFORMS, 2008.

Panel volunteer and participant on two deployed analyst panels, 77th Military Operations Research Society Symposium, United States Army Command and General Staff College, Fort Leavenworth, KS, June 16-18, 2009.

**HILL, RAYMOND R.,**

Professor of Operations Research, Department of Operational Sciences, AFIT Appointment Date: 2008 (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, experimental design, design and analysis of heuristics, applied optimization modeling and applied simulation modeling to include use of agent-based modeling methods. Tel. 937-255-6565 x7469 (DSN 785-6565 x7469), email: [Raymond.Hill@afit.edu](mailto:Raymond.Hill@afit.edu)

**SPONSOR FUNDED RESEARCH PROJECTS**

"Analysis of Missile Miss Distance Data." Sponsor: OSD. Funding: \$25,000. [COA]

"Examining Experimental Methods for Missile Testing." Sponsor: Eglin AFB. Funding: \$20,000. [COA]

**REFEREED JOURNAL PUBLICATIONS**

Aleman, R., R. R. Hill and X. Zhang, November 2008. A Ring-Based Diversification Scheme for Routing Problems. International Journal of Mathematics of Operational Research, Vol 1, Nos. 1-2, 163-190. [COA]

Marsh, W. E. and R. R. Hill. 2008. An Initial Agent Behavior Modeling and Definition Methodology as Applied to Unmanned Aerial Vehicle Simulations. International Journal of Simulation and Process Modeling, Vol 4, No. 2, 119-129. [COA]

**REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW**

Leggio, D. A. and R. R. Hill, "Application of Monte Carlo Sampling to Assess Experimental Designs in Developmental Test." Proceedings of the 2009 INFORMS Simulation Society Research Workshop, Warwick University, UK, June 25-27, 2009. [COA]

Hardman, N, J. Colombi, D. Jacques, R. Hill and J. Miller, "Persons in the Processes: Human Systems Integration in Early System Development." Proceedings of the International Council on Systems Engineering Conference, Singapore, June 2009. [COA]

Hardman, N., J. Colombi, D. Jacques, R. Hill and J. Miller, "The Challenges of Human Consideration in the Systems Engineering Technical Process," 7th Annual Conference on Systems Engineering Research 2009, Loughborough University, 20-23 April 2009. [COA]

Hill, R. R. and C. P. Chambal, "A Framework for Improving Experimental Design and Statistical Methods for Test and Evaluation," U.S. Air Force T&E Days 2009, AIAA 2009-1709, Albuquerque, NM, Feb 12-14, 2009. [COA]

**REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW**

Leggio, D. A., R. R. Hill, A. G. Roesener, S. Capehart, "Examining Methods to Reduce Wind Tunnel Test Data Requirements using the Design of Experiments (DOE)," 77th Military Operations Research Society Symposium (MORSS), Ft. Leavenworth, KS, June 2009. [COA]

Cohen, A., R. R. Hill, A. G. Roesener, S. Capehart, "Examining the Use of Split-Plot Designs and their Potential Use in Operational Testing," 77th Military Operations Research Society Symposium (MORSS), Ft. Leavenworth, KS, June 2009. [COA]

Hill, R. R. "Tutorial: Simulation-based Optimization for Military Applications," 2009 CORS/INFORMS Conference, Toronto, Canada, June 15-17, 2009. [COA]

“Analyzing the C-5 High Velocity Regionalized Isochronal Inspection Concept” with T. Heiman, M. Cooper, and A. Johnson, INFORMS National Meeting, October 12-15 2008, Washington DC. [COA]

“Center for Operational Analysis and TECP,” 2009 Annual AF T&E Conference, Nellis AFB, Las Vegas, NV, January 27, 2009. [COA]

“Assessment of Large Aircraft Maintenance Inspection Strategies” with T. Heiman, M. Cooper, and A. Johnson, Midwest Decision Sciences Institute Conference, 16-18 April 2009, Oxford OH. [COA]

“A Tabu Search with Vocabulary Building Approach for the Vehicle Routing Problem with Split Demands” with R. Aleman, 2009 CORS/INFORMS Conference, June 15-17, 2009. [COA]

#### BOOKS AND CHAPTERS IN BOOKS

Moore, James T., J. Wesley Barnes, and Raymond R. Hill, “Modeling the End-to-End Military Transportation Problem” book chapter, Chapter 6, Handbook of Military Industrial Engineering, edited by Adedeji B. Badiru and Marlin U. Thomas, Taylor and Francis/CRC Press, 2009. [COA]

Raymond R. Hill and Edward A. Pohl, “An Overview of Meta-Heuristics and their use in Military Modeling” book chapter, Chapter 9, Handbook of Military Industrial Engineering, edited by Adedeji B. Badiru and Marlin U. Thomas, Taylor and Francis/CRC Press, 2009. [COA]

Misty Gripper and Raymond R. Hill, “Human Factors in Military Systems” book chapter, Chapter 25, Handbook of Military Industrial Engineering, edited by Adedeji B. Badiru and Marlin U. Thomas, Taylor and Francis/CRC Press, 2009. [COA]

Heath, Brian L. and Raymond R. Hill, “Agent-Based Modeling: A Historical Perspective and a Review of Validation and Verification Efforts” book chapter, Chapter 12, Handbook of Research on Discrete Event Simulation Environments: Technologies and Applications, edited by Evon Abu-Taieh, IGI Publishing, Hershey, PA. [COA]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Associate Editor, Naval Research Logistics.

Associate Editor, Military Operations Research.

Associate Editor, Journal of Defense Modeling and Simulation.

Associate Editor, Journal of Simulation.

Associate Editor, Information Age Warfare Quarterly.

Associate Editor, International Journal of Mathematics in Operations Research.

#### **JOHNSON, ALAN W.,**

Associate Professor of Logistics Management, Department of Operational Sciences, AFIT Appointment Date: 2004 (AFIT/ENS); Center for Operational Analysis (COA), BS, Mechanical Engineering, Montana State University, 1982; MS, Systems Management, Air Force Institute of Technology, 1989; PhD, Industrial and Systems Engineering, Virginia Polytechnic Institute and State University, 1996. Dr. Johnson’s research interests include all aspects of military logistics, strategic airlift, space logistics, mobility, discrete-event simulation, logistics management, reliability and maintainability, and discrete optimization and heuristics. Tel. 937-255-3636 x4703 (DSN 785-3636 x4703), email: [Alan.Johnson@afit.edu](mailto:Alan.Johnson@afit.edu)



#### REFEREED JOURNAL PUBLICATIONS

Johnson, A.W., Michalski, S., Stiegelmeier, A., Pope, J., and Martindale, M., 2009, "Modeling Regeneration Time and Ground Support Manpower for a Reusable Launch Vehicle," Journal of Spacecraft and Rockets 46(1): 168-176. [COA]

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Johnson, A, Glasscock, C., Little, A., Muha, M., O'Malley, D., and Bennett, M. "C-5 Isochronal Inspection Process Modeling." Proceedings, Winter Simulation Conference, Miami, FL, 7-10 Dec 08. [COA]

Johnson, A.W. and Servidio, J., "Ground Support Process Time Refinement for Reusable Launch Vehicle Regeneration Modeling," Proceedings of the American Institute of Aeronautics and Astronautics Space 2008 Conference, San Diego CA, AIAA-2008-7647. [COA]

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Midwestern Decision Sciences Institute Conference, 16-18 April 2009, Oxford OH (with T. Heiman, M. Cooper, and R. Hill), "Assessment of Large Aircraft Maintenance Inspection Strategies." [COA]

AIAA 34th Annual Dayton-Cincinnati Aerospace Symposium, 3 March 2009, Dayton OH (with C. Molina and A.G. Roesener), "Reusable Launch Vehicle Design Implications for Regeneration Time." [COA]

INFORMS National Meeting, October 12-15 2008, Washington DC (with M Cooper, T Heiman and R. Hill), "Analyzing the C-5 High Velocity Regionalized Isochronal Inspection Concept." [COA]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Secretary/Treasurer, Military Applications Society, INFORMS.

Member of the Editorial Board, International Journal of Operations Research and Information Systems (IJORIS).

Manuscript reviewer for Computers and Operations Research.

Manuscript reviewer for Journal of Spacecraft and Rockets (3).

#### **KEBIR, YUCEF,**

Associate Professor of Operations Research, Department of Operational Sciences, AFIT Appointment Date: 2008 (AFIT/ENS); MS Operations Research, Stanford University, 1980; PhD, Operations Research, Northwestern University, 1985. Dr. Kebir's research interests include operations research, applied probability, applied stochastic processes, stochastic ordering, queuing systems, reliability theory, dynamic programming, Markov decision processes, and decision analysis. Tel. 937-255-3636 x4319, (DSN 785-3636x4319), email: [Youcef.Kebir@afit.edu](mailto:Youcef.Kebir@afit.edu)

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Recipient of the Faculty-of-the-Quarter Award – Winter 2009.



**MATTIODA, DANIEL D., Maj,**

Assistant Professor of Logistics Management, Department of Operational Sciences, AFIT Appointment Date: 2007 (AFIT/ENS); Center for Operational Analysis (COA), BS Professional Aeronautics, Embry Riddle Aeronautical University 1997; MS Logistics and Acquisition Logistics Management, Air Force Institute of Technology, 2002; PhD Business Administration; Concentration: Marketing/Supply Chain Management, The University of Oklahoma – Norman, 2007. Maj Mattioda's research interests include collaboration and flexibility in the supply chain; reverse logistics; international logistics; lean, agile, and leagile logistics; and using simulation to model supply chain processes. Tel. 937-255-3636 x7946 (DSN 785-3636 x7946), email: [Daniel.Mattioda@afit.edu](mailto:Daniel.Mattioda@afit.edu)

**REFEREED JOURNAL PUBLICATIONS**

Daugherty, Patricia J., Haozhe Chen, Daniel D. Mattioda, and Scott J. Grawe (2009), "Marketing/Logistics Relationships: Influence on Capabilities and Performance," Journal of Business Logistics, Vol. 30, No. 1, pp. 1-18. [COA]

Grawe, Scott J., Haozhe Chen, Daniel D. Mattioda, and Patricia Daugherty (2008), "Profit Contribution Information's Impact on Internal Integration," Journal of Transportation Management, Vol. 19, No. 2, pp. 38-53. [COA]

Skipper, Joseph, Joseph Huscroft, Daniel Mattioda, and Dianne Hall, (2008) "Supply Chain Organizational Flexibility and Information Technology's Confounding Effects," Logistics Spectrum, Vol 42, No 3, pp. 11-20. [COA]

**REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW**

Mattioda, Daniel (2009), "Logistics Flexibility: A Military Perspective," CORS-Informs International 2009, Toronto, Canada. [COA]

Huscroft Joseph R, Joseph Skipper, Dianne Hall, and Daniel Mattioda (2008), "Flexibility in the Supply Chain: Can Information Have a Negative Impact," International Society of Logistics (SOLE), Orlando, FL. [COA]

**OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES**

HQ AETC/A7S LOGDET Consolidation Study.

**MILLER, JOHN O.,**

Associate Professor of Operations Research, Department of Operational Sciences, AFIT Appointment Date: 2002 (AFIT/ENS); Deputy Department Head, Department of Operational Sciences, BS, United States Air Force Academy, 1980; MBA, University of Missouri at Columbia, 1983; MS, Air Force Institute of Technology, 1987; PhD, The Ohio State University, 1997. Dr. Miller's research interests include simulation, ranking and selection, combat modeling, and nonparametric statistics. Tel. 937-255-6565 x4326 (DSN 785-6565 x4326), email: [John.Miller@afit.edu](mailto:John.Miller@afit.edu)

**SPONSOR FUNDED RESEARCH PROJECTS**

"Air Force Standard Analysis Toolkit Support." Sponsor: AF/A9B. Funding: \$40,000. [COA]

**REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW**

Miller, J.O., "Unmanned Aerial System Analysis Using Agent Based Modeling," Industrial Engineering Research Conference 2009, Miami, FL, June 2009. [COA]

## OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

INFORMS Simulation Society Council Representative (elected position).

Associate Editor for International Journal of Operations Research.

Journal referee for Military Operations Research.

Journal referee for International Journal of Logistics: Research and Applications.

Journal referee for The Journal of Defense Modeling and Simulation.

ENS Deputy Department Head (Jul 08 – present).

Member AF Modeling and Simulation Workforce Development Working Group.

OR-Ohio lead representative for AFIT. Presented 1.5 hour tutorial on “Combat Modeling: Background, Theory, and Applications” on 13 Feb 2009 at Wright State University to group of approximately 40 students and faculty from AFIT, The Ohio State University, Wright State University, and the University of Cincinnati.

## **MOORE, JAMES T.,**

Professor of Operations Research, Department of Operational Sciences, AFIT Appointment Date: 1998 (AFIT/ENS); Center for Operational Analysis (COA), BA, University of Colorado, 1974; MBA, University of Wyoming, 1978; MS, Air Force Institute of Technology, 1981; PhD, The University of Texas at Austin, 1988. Dr. Moore's research interests include optimization theory, integer programming, scheduling, heuristics, and mobility modeling. Tel. 937-255-3636 x4528 (DSN 785-3636 x4528), email: [James.Moore@afit.edu](mailto:James.Moore@afit.edu)

## SPONSOR FUNDED RESEARCH PROJECTS

"JDPAC and AFIT Distribution Research Proposal." Sponsor: USTRANSCOM. Funding: \$300,000. [COA]

## REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Geyer, Andrew, Shane Hall, and James Moore, “Operations-focused Optimized Theater Weather Sensing Strategies,” Military Operations Research Society Symposium, Fort Leavenworth, KS, 16-18 June 2009. [COA]

Kennedy, Kevin, Richard Deckro, James Moore, and Kenneth Hopkinson, “Targeting Closeness of Human Networks,” Military Operations Research Society Symposium, Fort Leavenworth, KS, 16-18 June 2009. [COA]

Kennedy, Kevin, Richard Deckro, James Moore, and Kenneth Hopkinson, “Nodal Interdiction,” Military Operations Research Society Symposium, Fort Leavenworth, KS, 16-18 June 2009. [COA]

Moore, James, “Integer Formulations and Solutions to Magic Squares and Other Popular Games,” Military Operations Research Society Symposium, Fort Leavenworth, KS, 16-18 June 2009. [COA]

Nance, R. Larry, August Roesener, and James Moore, “An Advanced Tabu Search Approach to Solving the Mixed Payload Aircraft Loading Problem,” Military Operations Research Society Symposium, Fort Leavenworth, KS, 16-18 June 2009. [COA]

Burks, R. E., Harvey, M., and Moore, J. T., "Operational Logistics Planning: A Campaign Planning Decision Support Tool for Logisticians," Army Operations Research Symposium, Richmond, VA, October 2008. [COA]

Kennedy, Kevin T., Richard F. Deckro, and James T. Moore, "Cost and Robustness in Layered Infrastructure Networks," Institute for Operations Research and the Management Sciences (INFORMS) Conference, Washington D.C., 12-15 October 2008. [COA]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Military Operations Research Editorial Board.

International Journal of Operational Research Editorial Board.

Department P&T Chair.

Member School P&T Committee.

Acting OR Division Chief Sep 08 to Jan 09.

#### **OGDEN, JEFFERY A.,**

Assistant Professor of Logistics Management, AFIT Appointment Date: 2006 (AFIT/ENS); BS, Accounting. Weber State University, 1998; MBA with emphasis in Supply Chain Management, Arizona State University, 2000; PhD, Business Administration with emphasis in Supply Chain Management, Arizona State University, 2003. Dr. Ogden's research interests include strategic purchasing, supply base optimization, logistics management, quality management, e-marketplaces, RFID, and supply chain management. Tel. 937-255-3636 x4653 (DSN 785-3636 x4653), email: [Jeffrey.Ogden@afit.edu](mailto:Jeffrey.Ogden@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

"ECSS Research Office." Sponsor: ECSS. Funding: \$35,048. [COA]

#### REFEREED JOURNAL PUBLICATIONS

Fawcett, S.E., Allred, C., Magnan, G., and Ogden, J.A. (2009) "Benchmarking the Viability of SCM for Entrepreneurial Business Model Design," *Benchmarking: An International Journal*, Vol. 16, No. 1, 5-29. [COA]

Foster, S. T. and Ogden, J.A. (2008) "On Differences in How Operations and Supply Chain Managers Approach Quality Management," *International Journal of Production Research*, Vol. 46, No. 24, 6945-6961. [COA]

Ogden, J. A., Lowry, P.B., Petersen, K.J. and Carter, P.L. (2008) "Explaining the Key Elements of Supply-Chain Strategy that are Necessary for Business-to-Business Electronic Marketplace Survival," *Supply Chain Forum: An International Journal*, Vol. 9, No. 1, 92-110. [COA]

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Ogden, J.A. and Sprague, T. (2009) "Effective Training and Education Processes for Large Scale IT Implementations," presented at the 20th Annual Conference of the Production and Operations Management Society, Orlando, Florida, May 2009. [COA]

Buyukgural, F., Cooper, M. and Ogden, J.A. (2009) "Assessing Performance-Based Logistics Contract Results," presented at the 20th Annual Conference of the Production and Operations Management Society, Orlando, Florida, May 2009. [COA]

Ogden, J.A., Swartz, S., Randall, W., Donovan, P. and Brady, S. (2009) "Logistics Research in the Public Sector," presented at the 20th Annual Conference of the Production and Operations Management Society, Orlando, Florida, May 2009. [COA]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Reviewed for the International Journal of Production Economics.

Reviewed for the Journal of Supply Chain Management.

Reviewed for the International Journal of Operations & Production Management.

Member of SOLE – The International Society of Logistics Awards Committee.

The following article was highly commended in the 2008 Emerald Literati Network Awards for Excellence – Outstanding Paper Competition: Ogden, J.A. and Carter, P.L. (2008) "The Supply Base Reduction Process: An Empirical Investigation," The International Journal of Logistics Management, Vol. 19, No. 1, 5-28.

Involved in a project looking at the Boeing C-17 spare parts inventory management processes and information systems and how they may potentially be used as pathfinders for the Global Logistics Support Center (GLSC).

#### **PETTIT, TIMOTHY J., Lt Col,**

Assistant Professor of Logistics and Supply Chain Management, Department of Operational Sciences, AFIT. Appointment Date: 2008 (AFIT/ENS); BS, Aerospace Engineering, Iowa State University, 1991; MS, Logistics Management, Air Force Institute of Technology, 1996; PhD, Business Administration (Logistics), The Ohio State University, 2008. Lt Col Pettit's research interests are in supply chain resilience, risk management, supply chain management and process improvement. Tel. 937-255-3636 x4525 (DSN 785-3636 x4525), email: [Timothy.Pettit@afit.edu](mailto:Timothy.Pettit@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

"Research, Analysis, and Transition Support to the Director of Logistics and Sustainment Air Force Material Command." Sponsor: HQ AFMC. Funding: \$200,000. [COA]

"Supply Chain Resilience in a Global Enterprise." Sponsor: The Ohio State University Research Foundation. Funding: \$44,000. [COA]

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

"Resilience of Emergency Management: Assessment and Benchmarking for Maximization of Mission Effectiveness," Timothy J. Pettit, CORS-INFORMS Joint International Conference, 16 Jun 09, Toronto, Canada. [COA]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Invited reviewer for the Council of Supply Chain Management Professional's Educators Conference on the track for Supply Chain Sustainability.

**ROESENER, AUGUST G., Maj,**

Assistant Professor of Operations Research, Department of Operational Sciences, AFIT Appointment Date: 2006 (AFIT/ENS); BS, United States Air Force Academy, 1998; MS, The University of Florida, 2002; PhD, The University of Texas at Austin, 2006. Capt Roesener's research interests include linear and integer optimization, heuristics search algorithms, and experimental design. Tel. 937-255-3636 x4539 (DSN 785-3636 x4539), email: [August.Roesener@afit.edu](mailto:August.Roesener@afit.edu)

**REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW**

Johnson, A.W., C. Molina and A.G. Roesener. "Reusable Launch Vehicle Design Implications for Regeneration Time," American Institute of Aeronautics and Astronautics 34th Annual Dayton-Cincinnati Aerospace Symposium, Dayton, OH, March 3, 2009. [COA]

Nance, R. L., A. G. Roesener and J. T. Moore. "An Advanced Tabu Search for Solving the Mixed Payload Airlift Loading Problem." 77th Military Operations Research Society Symposium, Fort Leavenworth, KS, June 16-18, 2009. [COA]

Cohen, A.N., R.R Hill, A.G. Roesener and S.R. Capehart. "Examining the Use of Split-Plot Designs and Their Potential Use in Operational Testing." 77th Military Operations Research Society Symposium, Fort Leavenworth, KS, June 16-18, 2009. [COA]

Leggio, D., R.R Hill, A.G. Roesener and S.R. Capehart. "Examining Methods to Reduce Wind Tunnel Test Data Requirements Using The Design of Experiments (DOE)." 77th Military Operations Research Society Symposium, Fort Leavenworth, KS, June 16-18, 2009. [COA]

**OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES**

Reviewed "Efficient Modeling and Simulation of Biological Warfare Using Innovative Design of Experiments Methods" (MORS Journal).

**SKIPPER, JOSEPH B., Maj,**

Assistant Professor of Logistics, Department of Operational Sciences, AFIT Appointment Date: 2008 (AFIT/ENS); BS, Troy State University, 1992; MS, Air Force Institute of Technology, 2002; PhD, Auburn University, 2008. Maj Skipper's research interests include supply chain management, supply chain disruptions, organizational flexibility and resilience, and disruption avoidance. Tel. 937-255-3636 x7948 (DSN 785-3636 x7948), email: [Benjamin.Skipper@afit.edu](mailto:Benjamin.Skipper@afit.edu)

**SPONSOR FUNDED RESEARCH PROJECTS**

"Leading Edge Supply Chain: Identifying Ways to Improve Weapon Systems Sustainment and Logistics Support." Sponsor: AFRL/RX. Funding: \$90,000. [COA]

**REFEREED JOURNAL PUBLICATIONS**

Skipper, Joseph, Joseph Huscroft, Daniel Mattioda, and Dianne Hall, (2008) "Supply Chain Organizational Flexibility and Information Technology's Confounding Effects," Logistics Spectrum, Vol 42, No 3, pp. 11-20. [COA]

Skipper, Joseph, Dianne Hall, Joe Hanna (2009), "Top Management Support, External and Internal Organizational Collaboration, and Organizational Flexibility in Preparation for Extreme Events," Journal of Information System Security, Vol 5, No 1, pp. 32-60. [COA]

Skipper, Joseph, Joe Hanna, Casey Cegielski (2009), "Supply Chain Contingency Planning and Firm Adoption: An Initial Look at Differentiating the Innovators," Transportation Journal, Spring 2009, Vol 48, No 2, pp. 40-62. [COA]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Maj Ben Skipper participated in Univied Engagement (UE) '08, a CSAF sponsored Wargame in Garmisch, Germany, involving representatives from UK, Australia, Canada, and all US services. Maj Skipper was selected as an outstanding performer by the CJTF/C4 (USA BG Cross, Quartermaster of the Army).

#### **THOMAS, MARLIN U.,**

Dean, Graduate School of Engineering and Management, Air Force Institute of Technology, Wright-Patterson Air Force Base, Ohio; BSE, University of Michigan-Dearborn, 1967; MSE, University of Michigan, 1968; PhD, University of Michigan, 1971. He has held several academic and leadership appointments at private and state universities. These positions include faculty, department head, and research center directorships. He also served a 32-year combined active and reserve career as a Navy civil engineer corps officer. He held several command and staff assignments, including naval construction battalion and regimental commands. Dr. Thomas' research interests are in stochastic modeling, reliability and evaluating logistics systems with emphasis on optimal design for contingency operations. He has authored or co-authored more than 80 archival articles and delivered more than 100 presentations at major conferences. He has served on six editorial boards, including area editor for Operations Research, department editor for IIE Transactions and consulting editor for McGraw-Hill. He has also served on numerous national committees, boards, and advisory panels for academics and research, and is a former member of the Army Science Board. He has numerous military and civilian awards. Professional Memberships and Associations: American Indian Science and Engineering Society; American Society for Engineering Education; Fellow, American Society for Quality; Fellow and former President, Institute of Industrial Engineers, Fellow and former Secretary, Institute for Operations Research and Management Sciences; Registered Professional Engineering, Michigan; Former Area Editor, Military Operations Research; Former Department Editor, Stochastic Modeling, IIE Transactions; Associate Editor, Computers and Industrial Engineering; Former Consulting Editor, McGraw-Hill Encyclopedia for Science and Technology.

#### BOOKS AND CHAPTERS IN BOOKS

Thomas, M.U., "Inventory models for contingency operations," in Handbook of Military Industrial Engineering, Eds: A.B. Badiru and M.U. Thomas, Taylor & Francis, Boca Raton, 2008.

Thomas, M.U. and M.A. Lawley, "Reserve Manufacturing capacity for augmenting contingency logistics requirements," in Handbook of Military Industrial Engineering, Eds: A.B. Badiru and M.U. Thomas, Taylor & Francis, Boca Raton, 2008.

Badiru, Adedeji B. and Marlin U. Thomas, editors, Handbook of Military Industrial Engineering, Taylor & Francis CRC Press, 2009.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

National Research Council - Panel on Survivability/Lethality Analysis, 2009-10.

U.S. Government - Department of Commerce Emerging Technologies Research Advisory Committee, 2009.

Dayton Area Graduate Studies Institute, Operations Committee.

Lean Aerospace Initiative Educational Network, Advisory Board.

Holzman Learning Center Dedication Ceremony, University of Pittsburgh, October 3, 2008.

**WEIR, JEFFERY D.,**

Associate Professor of Operations Research, AFIT Appointment Date: 2002 (AFIT/ENS); Center for Operational Analysis (COA), Bachelors of Electrical Engineering, Georgia Institute of Technology, 1988; MAS, Embry Riddle Aeronautical University, 1992; MS, Air Force Institute of Technology, 1995; PhD, Georgia Institute of Technology, 2002. Dr. Weir's research interests include large-scale optimization, mathematical programming and decision analysis. He is a member of the Institute for Operations Research and Management Science (INFORMS), the Military Operations Research Society (MORS), the Institute of Industrial Engineers (IIE) and the Decision Sciences Institute (DSI). Tel. 937-255-3636 x4538 (DSN 785-3636 x4538), email: [Jeffery.Weir@afit.edu](mailto:Jeffery.Weir@afit.edu)

**SPONSOR FUNDED RESEARCH PROJECTS**

"AFIT Analysis Support to JIEDDO, Task 1a." Sponsor: JIEDDO. Funding: \$587,560. [COA]

"Effects-Based Operations (EBD) Research Consortium." Sponsor: AFRL/RI. Funding: \$15,000.

**REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW**

77th Military Operations Research Society Symposium 16-18 Jun 2009, "Creating Multi Objective Value Functions for Additive Value Models," Christopher Richards and Jeffery Weir. [COA]

10th Annual Decision Analysis Affinity Group Conference 19-20 May 2009, Invited Speaker "Case Study: Joint Improvised Explosive Device Defeat Organization Value Modeling," Jeffery Weir, Kenneth Bauer, Shane Knighton, Christina Willy and Christopher Richards. [COA]

**OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES**

Journal of the Military Operations Research Society Reviewer.

Helped organize Military Operations Research Society Nuclear online Workshop.

**ZALEWSKI, DANIEL J., Col,**

Senior Military Professor, Department of Operational Sciences, AFIT Appointment Date: 2005 (AFIT/ENS); Center for Operational Analysis (COA), BS, United States Air Force Academy, 1983; MS, George Mason University, 1989; PhD, Air Force Institute of Technology, 1995. Colonel Zalewski's research interests include military modeling and simulation, process control, artificial intelligence, and neural networks.

**SPONSOR FUNDED RESEARCH PROJECTS**

"Quadrennial Defense Review Support Studies." Sponsor: HQ USAF QDR Office. Funding: \$200,000.

## **5.6. DEPARTMENT OF SYSTEMS AND ENGINEERING MANAGEMENT**

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<b>5.6.1</b>	<b><u><a href="#">DOCTORAL DISSERTATIONS</a></u></b>	<b>171</b>
<b>5.6.2</b>	<b><u><a href="#">MASTER'S THESES</a></u></b>	<b>171</b>
<b>5.6.3</b>	<b><u><a href="#">GRADUATE RESEARCH PAPERS</a></u></b>	<b>174</b>
<b>5.6.4</b>	<b><u><a href="#">FACULTY RESEARCH OUTPUT</a></u></b>	<b>176</b>



### 5.6.1. DOCTORAL DISSERTATIONS

KUHN, JEFFREY D., *Changes in Structural Health Monitoring System Capability Due to Aircraft Environmental Factors*. AFIT/DS/ENV/09S-01. Faculty Advisor: Dr. Som R. Soni. Sponsor: N/A.

### 5.6.2. MASTER'S THESES

AKINLEMIBOLA, BOLANLE, *The Systems Engineering Design of an Energy Prediction Tool*. AFIT/GSE/ENV/09J-01. Faculty Advisor: Dr. David R. Jacques. Sponsor: AFRL/RZ.

BARKER, MARGARET A., GURBUZ, FATIH S., and SCHROEDER, JEREMY A., *Assessing Structural Health Monitoring Alternatives Utilizing a Value-Focused Thinking Model*. AFIT/GSE/ENV/09-M04. Faculty Advisor: Dr. Som Soni. Sponsor: N/A.

BARNUM, JOSEPH M., *Analysis of the Military Medical Retirement System*. AFIT/GCA/ENV/09-M01. Faculty Advisor: Lt Col Eric J. Unger. Sponsor: AFPC/DPSD.

BATTEN, TIMOTHY W., *Field Evaluation of a Novel Exposure Assessment Strategy Using Respirable Coal Dust Exposures During Heat Plant Coal Receiving Operations*. AFIT/GIH/ENV/09-M01. Faculty Advisor: Maj Jeremy M. Slagley. Sponsor: USAFSAM.

BAUER, JOSEPH M., *Modeling U.S. Occupational Health Costs*. AFIT/GCA/ENV/09-M02. Faculty Advisor: Maj Jeremy M. Slagley. Sponsor: 75 AMDS/SGPB.

BEHM, STEPHEN M., PITZER, BRADFORD J., and WHITE, JANE F., *A Tailored Systems Engineering Framework for Science and Technology Projects*. AFIT/GSE/ENV/09-M02. Faculty Advisor: Dr. David R. Jacques. Sponsor: AFRL/XP.

BROWN, DAVID S., *An Evaluation of Solar Air Heating at United States Air Force Installations*. AFIT/GCA/ENV/09-M03. Faculty Advisor: Lt Col Eric J. Unger. Sponsor: HQ USAF.

BROWN, REBECCA S., *An Analysis of Construction Contractor Performance Evaluation System*. AFIT/GEM/ENV/09-M01. Faculty Advisor: Lt Col Christopher J. West. Sponsor: USACE.

CEBECI, FATIH, *Implementation of Performance-Based Acquisition in Non-Western Countries*. AFIT/GLM/ENV/09-M01. Faculty Advisor: Lt Col R. David Fass. Sponsor: N/A.

CHAPARRO, ORLANDO M., *Heterogeneity Effects in Plutonium Contaminated Soil*. AFIT/GES/ENV/09-M01. Faculty Advisor: Lt Col David A. Smith. Sponsor: N/A.

CONNER, J. PAUL, *The Social Influence Qualities of Social Network Sites: A Qualitative and Experimental Investigation*. AFIT/GEM/ENV/09-M02. Faculty Advisor: Lt Col Alexander J. Barelka. Sponsor: 711 HPW/RH.

CONSTANTINE, ALEXANDER N., *Information Technology and the Evolution of the Library*. AFIT/GRD/ENV/09M-01. Faculty Advisor: Dr. Alan R. Heminger. Sponsor: N/A.

COTTON, D. LARRY and HAASE, GARRY A., *Value-Driven Enterprise Architecture Score: Evaluation Applied to Joint Force Protection Future State Design*. AFIT/GSE/ENV/09-M03. Faculty Advisor: Maj Jeffrey D. Havlicek. Sponsor: AFMC/ESC.

CRING, ERIC A. and LENFESTEY, ADAM G., *Architecting Human Operator Trust in Automation to Improve System Effectiveness in Multiple Unmanned Aerial Vehicles (UAV)*. AFIT/GSE/ENV/09-M06. Faculty Advisor: Dr. John Colombi. Sponsor: 711 HPW/RH.

DOTZLAF, ROSS E., *Modernizing a Preventive Maintenance Strategy for Facility and Infrastructure Maintenance*. AFIT/GEM/ENV/09-M03. Faculty Advisor: Dr. Alfred E. Thal Jr. Sponsor: HQ ACC.

DOWNEN, MAUREEN A., *Evaluation of an Innovative Technology for Treatment of Water Contaminated With Perchlorate and Organic Compounds*. AFIT/GEM/ENV/09-M04. Faculty Advisor: Dr. Mark N. Goltz. Sponsor: OSD/ATL.

FARRELL, SHANNON M., *Waypoint Generation Based on Sensor Aimpoint*. AFIT/GAE/ENV/09-M01. Faculty Advisor: Dr. David R. Jacques. Sponsor: AFRL/RW.

FETTERS, MICHAEL A., *Achieving Alignment: An Analysis of Enterprise Architecture Best Practices Within the United States Air Force*. AFIT/GIR/ENV/09-M01. Faculty Advisor: Dr. John M. Colombi. Sponsor: HQ USAF/SE.

FREDIN, PAUL W., *Ground Source Heat Pumps vs. Conventional HVAC: A Comparison of Economic and Environmental Costs*. AFIT/GEM/ENV/09-M05. Faculty Advisor: Dr. Alfred E. Thal Jr. Sponsor: N/A.

GIBSON, WILLIAM T., *Jet Fuel Hedging Strategies for the Department of Defense Through Use of Financial Derivatives*. AFIT/GCA/ENV/09-M04. Faculty Advisor: Maj Todd A. Peachey. Sponsor: SAF.

GRAY, STEPHEN E., *The Correlation of Human Capital on Costs of Air Force Acquisition Programs*. AFIT/GCA/ENV/09-M05. Faculty Advisor: Lt Col Patrick D. Kee. Sponsor: AESW.

GREGORY, AARON L., *Modeling the Economic Impacts of Large Deployments on Local Communities*. AFIT/GCA/ENV/08-D01. Faculty Advisor: Lt Col Jeffery Smith. Sponsor: N/A.

GURBUZ, FATIH S., See BARKER, MARGARET A.

GUZMAN, JUAN J., *An Econometric Analysis of the Effectiveness of Compensation to Retention*. AFIT/GCA/ENV/09-M06. Faculty Advisor: Lt Col Eric J. Unger. Sponsor: HQ AFMC.

HAASE, GARRY A., See COTTON, D. LARRY.

HAMMOND, GREGORY D., *Perceived Need for Change: A Test of Individual Emotion and Contextual Influences*. AFIT/GEM/ENV/09-M06. Faculty Advisor: Lt Col Dean Vitale. Sponsor: HQ AMC.

HESS, TYLER J., *Cost Forecasting Models for the Air Force Flying Hour Program*. AFIT/GCA/ENV/09-M07. Faculty Advisor: Lt Col Eric J. Unger. Sponsor: AFMC.

HICKAM, MICHAEL J., *A Cost Analysis of Dining Facilities: Should the Air Force Continue to Operate Dining Facilities?* AFIT/GFA/ENV/09-M01. Faculty Advisor: Lt Col Patrick D. Kee. Sponsor: HQ ACC.

LeBRUN, MICHAEL T., *The Economic Impact of a Radiological Dispersal Device (RDE)*. AFIT/GFA/ENV/09-M02. Faculty Advisor: Lt Col David A. Smith. Sponsor: 711 HPW/RH.

LECHNER, KRISTINA, *Evaluation of High Confidence Criteria Using a Case Study of the Multi-Platform Radar Technology Insertion Program*. AFIT/GRD/ENV/09-M03. Faculty Advisor: Dr. Alfred E. Thal Jr. Sponsor: ESC/CC.

LEDFORD, CHRISTOPHER B., *Dynamic Modeling of the Economic Impacts of a Terrorist Attack Using a Radiological Dispersion Device*. AFIT/GEM/ENV/09-M07. Faculty Advisor: Lt Col David A. Smith. Sponsor: AETC.

LEE, SANG M., *Daylighting Strategies for U.S. Air Force Office Facilities: Economic Analysis of Building Energy Performance and Life-Cycle Cost Modeling With Monte Carlo Method*. AFIT/GEM/ENV/09-M08. Faculty Advisor: Lt Col Eric J. Unger. Sponsor: HQ USAF & AFCESA.

LEGRADI, JOSEPH D., *An Exploratory Social Network Analysis of Military and Civilian Emergency Operation Centers Focusing on Organization Structure*. AFIT/GEM/ENV/09-M09. Faculty Advisor: Lt Col David A. Smith. Sponsor: HQ USAF.

LENFESTEY, ADAM G., See CRING, ERIC A.

MALDONADO, FERDINAND, *The Hybrid Counterinsurgency Strategy: System Dynamics Employed to Develop a Behavioral Model of Joint Strategy*. AFIT/GEM/ENV/09-M10. Faculty Advisor: Dr. Michael L. Shelley. Sponsor: HQ USAF.

MARKOPOULOS, ANTONIOS, *Analysis and Modeling of Motor Vehicle Crashes Involving Air Force Military Personnel*. AFIT/GCA/ENV/09-S01. Faculty Advisor: Maj Jeremy M. Slagley. Sponsor: AFSC/SEAR.

MASTRO, PETER C. and ORCUTT, RICHARD L., *Application of Reliability and Linear Regression to Enterprise Architecture in Support of the US Air Force's Capability Review and Risk Assessment*. AFIT/GSE/ENV/09-M05. Faculty Advisor: Dr. David R. Jacques. Sponsor: SAF.

McCOMB, JERROD P., *A Metagenomic Analysis of Microbial Contamination in Aviation Fuels*. AFIT/GEM/ENV/09-M11. Faculty Advisor: Dr. Charles Bleckmann. Sponsor: University of Dayton.

McGILL, DAPHNE R., *Task-Technology Fit Assessment of an Expertise Transfer System*. AFIT/GIR/ENV/09-M02. Faculty Advisor: Maj Todd A. Peachey. Sponsor: Oklahoma State University.

McLAUGHLIN, WILLIAM J., *Modeling of Aircraft Deicing Fluid Induced Biochemical Oxygen Demand in Subsurface-Flow Constructed Treatment Wetlands*. AFIT/GEM/ENV/09-M12. Faculty Advisor: Dr. Charles Bleckmann. Sponsor: 312 AESG/SYE.

MILLS, CRAIG E., *Value-Driven Enterprise Architecture Evaluation for the Joint Force Protection Advanced Security System*. AFIT/GEM/ENV/09-M13. Faculty Advisor: Dr. Alfred E. Thal Jr. Sponsor: AFMC/ESC.

MILLS, STEPHANIE J., *Social Networking Website Users and Privacy Concerns: A Mixed Methods Investigation*. AFIT/GEM/ENV/09-M14. Faculty Advisor: Lt Col Alexander J. Barelka. Sponsor: 711 HPW/RH.

MOBLEY, GARLAND T., *An Investigation of Knowledge Transfer and Retention in a Government Procurement Office*. AFIT/GSS/ENV/09-M01. Faculty Advisor: Dr. Alan Heminger. Sponsor: SMC/MCSW.

MOORE, THOMAS W., *Recommendations for Conducting a Legal Review for Network Attack Weapon Acquisitions*. AFIT/GCO/ENV/09-M01. Faculty Advisor: Dr. Michael G. Grimaila. Sponsor: AFCYBER.

OLSON, MATTHEW T., *The Development of IT Suspicion as a Construct and Subsequent Measure*. AFIT/GEM/ENV/09-M15. Faculty Advisor: Lt Col Alexander J. Barelka. Sponsor: AFOSR/NL.

ORCUTT, RICHARD L., See MASTRO, PETER C.

OSGOOD, JUSTIN W., *Methodology for Value-Driven Enterprise Architecture Development Goals: Application to DoDAF Framework*. AFIT/GEM/ENV/09-M16. Faculty Advisor: Dr. Alfred E. Thal Jr. Sponsor: AFMC/ESC

PITZER, BRADFORD J., See BEHM, STEPHEN M.

POGORZELSKI, WILLIAM A., *Software Acquisition Improvement in the Aeronautical Systems Center*. AFIT/GRD/ENV/08-S1. Faculty Advisor: Lt Col Brian Hermann. Sponsor: N/A.

SCHMIDTGOESSLING, ROBERT D., *Shelter-In-Place: Indoor Exposure Assessment During an Airborne Chemical, Biological, Radiological, and Nuclear (CBRN) Event*. AFIT/GIH/ENV/09-M02. Faculty Advisor: Maj Jeremy M. Slagley. Sponsor: USAFSAM.

SCHROEDER, JEREMY A., See BARKER, MARGARET A.

SMITH, DANIEL K., *An Analysis of Defense Information and Information Technology Articles: A Sixteen Year Perspective*. AFIT/GIR/ENV/09-M03. Faculty Advisor: Dr. Dennis Strouble. Sponsor: N/A.

SWEENEY, DANIEL D., *Controlling Hazardous Noise and Dust Within the Industrial Workforce Using a Simple Barrier*. AFIT/GIH/ENV/09-M03. Faculty Advisor: Maj Jeremy M. Slagley. Sponsor: University of Cincinnati.

TORTELLA, JOSEPH A., *Operations Tempo and Turnover Intentions: An Exploratory Study of the Air Force's Explosive Ordnance Disposal (EOD) Career Field and Development of the Air Force Civil Engineer Retention Questionnaire*. AFIT/GEM/ENV/09-M17. Faculty Advisor: Lt Col Daniel T. Holt. Sponsor: HQ AFPC.

TUCKER, DANIEL, *An Assessment of the Air Force Weather Agency's Readiness for Knowledge Management Initiatives*. AFIT/GIR/ENV/09-M04. Faculty Advisor: Maj Todd A. Peachey. Sponsor: AFWA/CCC.

VITAS, JASON A., *The Impact of Acquisition Policy Variation on Program Strategy and Execution: A Case Study of the Joint Primary Aircraft Training System (JPATS) Program*. AFIT/GIR/ENV/09-M05. Faculty Advisor: Dr. Alan Heminger. Sponsor: 664 AESS.

VOTH, GREGORY W., *Classification of Schedule Management Barriers Through Concept Mapping*. AFIT/GRD/ENV/09-M05. Faculty Advisor: Lt Col Patrick D. Kee. Sponsor: ASC/AQF.

WALINSKI, RYAN G., *The Emergence of a Content Acceptance Model (CAM): New Thoughts Regarding the Trial, Adoption, and Usage of New Media*. AFIT/GEM/ENV/09-M18. Faculty Advisor: Lt Col Alexander J. Barelka. Sponsor: 711 HPW/RH.

WARD, DANIEL B., *The Effect of Values on System Development Project Outcomes*. AFIT/GSE/ENV/09-M08. Faculty Advisor: Dr. Dennis Strouble. Sponsor: AFRL/RV.

WHITE, JANE F., See BEHM, STEPHEN M.

WOODS, CHAD A., *An Economic Analysis of Military Family Housing: Should the Government Continue to Privatize?* AFIT/GFA/ENV/09-M03. Faculty Advisor: Maj Todd A. Peachey. Sponsor: SAF.

YELVERTON, STEVEN D., *Evaluating the Influence of Past Gaming Experience on Learner Preferences and Motivation to Learn in a Military Training Environment*. AFIT/GRD/ENV/09-M06. Faculty Advisor: Dr. Alfred E. Thal Jr. Sponsor: 82 TRW.

### **5.6.3. GRADUATE RESEARCH PAPERS**

CHASE, LEE E., *Integration of Cyber Situational Awareness (SA) into System Design and Development*. AFIT/ISE/ENV/09-J02. Faculty Advisor: Dr. John Colombi. Sponsor: HQ USAF.

DIAMOND, THEODORE T., RUTHERFORD, ADAM L., and TAYLOR, JONATHAN B., *Cooperative Unmanned Aerial Surveillance Control System Architecture*. AFIT/GSE/ENV/09-M07. Faculty Advisor: Dr. David R. Jacques. Sponsor: AFRL/RV & AFRL/RB.

INSLEY, DARRYL L., McKELLAR, BRIAN D., and VON DER FELSEN, JAN, *Linking Interoperability Characters and Measures of Effectiveness: A Methodology for Evaluating Architectures*. AFIT/ISE/ENV/09-J01. Faculty Advisor: Dr. David R. Jacques. Sponsor: AFRL/RV.

McKELLAR, BRIAN D., See INSLEY, DARRYL L.

RUTHERFORD, ADAM L., See DIAMOND, THEODORE T.

TAYLOR, JONATHAN B., See DIAMOND, THEODORE T.

VON DER FELSEN, JAN, See INSLEY, DARRYL L.

#### 5.6.4. FACULTY RESEARCH OUTPUT

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

##### **BADIRU, ADEDEJI B.,**

Professor and Head, Department of Systems & Engineering Management, AFIT Appointment Date: 2006 (AFIT/ENV); 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 (DSN 785-3636 x4799), email: [Adedeji.Badiru@afit.edu](mailto:Adedeji.Badiru@afit.edu)

##### REFEREED JOURNAL PUBLICATIONS

Badiru, Adedeji B., "Earning Value to Save Projects," *Value World*, Vol. 32, No. 3, Fall 2009, pp. 15-22.

Yang, B., A. B. Badiru. "A population management genetic algorithm on coordinated scheduling problem between suppliers and manufacturer," *Journal of the Korea Safety Management and Science* 11(3), 2009: 131-138.

Badiru, Adedeji B. and Anotu Ijaduola, "Half-Life Theory of Learning Curves for System Performance Analysis," *IEEE Systems Journal*, Vol. 3, No 2, June 2009, pp. 154-165.

##### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Badiru, Adedeji B., "Earning Value to SAVE Projects," in *Proceedings of 2009 SAVE International 49<sup>th</sup> Annual Conference*, Detroit, MI, June 29 – July 2, 2009.

Badiru, Adedeji B., Denise Jackson, and Greg Sedrick, "Functional Development of Performance Metrics for System of Systems," in *Proceedings of 2009 Industrial Engineering Research Conference (IERC)*, Miami, Florida, May 29 – June 3, 2009.

Badiru, Adedeji B., Ravindra Ahuja, and Ashish Nemani, "New Models and Algorithmic Approaches for Resource-Constrained Project Management," in *Proceedings of 2009 Industrial Engineering Research Conference (IERC)*, Miami, Florida, May 29 – June 3, 2009.

##### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Badiru, Adedeji B., "Half-Life Learning Curve Computations for Human Performance Enhancement," presented at 2009 United States Air Trade and Technology (USATT) Expo, Dayton, OH, July 14-17, 2009.

Badiru, Adedeji B., Jeremy Slagley, and David A. Smith, "Project Life Cycle Model for ABET Site Visit Preparation," ABET Best Assessment Processes XI Symposium, Indianapolis, Indiana, USA, April 3-4, 2009.

Badiru, Adedeji, "Project Management Tools and Techniques for Education, Training, and Research," Air Force Air Education and Training Command (AETC) Symposium, San Antonio, TX, Jan 15-16, 2009.

##### BOOKS AND CHAPTERS IN BOOKS

Badiru, Adedeji B., STEP Project Management: Guide for Science, Technology, and Engineering Projects, Taylor & Francis CRC Press, 2009.

Badiru, Adedeji B. and Marlin U. Thomas, editors, Handbook of Military Industrial Engineering, Taylor & Francis CRC Press, 2009.

Badiru, Adedeji B. and Anotu Ijaduola, "Half-Life Theory of Learning Curves," in Handbook of Military Industrial Engineering, Badiru, A. B. and M. U. Thomas, Editors, CRC Press/Taylor and Francis, Boca Raton, FL, 2009, pp. 33-1 to 33-28.

Badiru, Adedeji B., "Critical Resource Diagramming and Work Rate Analysis," in Handbook of Military Industrial Engineering, Badiru, A. B. and M. U. Thomas, Editors, CRC Press/Taylor and Francis, Boca Raton, FL, 2009, pp. 30-1 to 30-24.

Badiru, Adedeji B. and Charles H. Aikens, "Optimization Model for Military Budget Allocation and Capital Rationing," in Handbook of Military Industrial Engineering, Badiru, A. B. and M. U. Thomas, Editors, CRC Press/Taylor and Francis, Boca Raton, FL, 2009, pp. 8-1 to 8-22.

Badiru, Adedeji B., "Hierarchical Dynamic Decision Making," in Handbook of Military Industrial Engineering, Badiru, A. B. and M. U. Thomas, Editors, CRC Press/Taylor and Francis, Boca Raton, FL, 2009, pp. 24-1 to 24-12.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

ABET Program Evaluator (PEV), May 2009 – Present.

Program review of Masters in Engineering Management program, University of Maryland, Baltimore County, Maryland, March 12-13, 2009.

Member, conference program committee, ASCE International Conference on Vulnerability and Risk Analysis and Management, University of Maryland, April 11-13, 2011 (2009-2011).

Awards Committee Member, Affiliate Societies Council of Dayton, Ohio, 2009 – 2012.

Member, Program Committee, International Workshop on Knowledge Discovery from Sensor Data (SensorKDD-2009), Paris, France, June 2009.

#### **BARELKA, ALEXANDER J., Lt Col,**

Assistant Professor of Management. BS in Imaging Science, Rochester Institute of Technology, 1992; MS in Information of Resource Management, Air Force Institute of Technology, Dayton, OH, 2001; PhD in Business Administration, concentrating in Management, Michigan State University, 2006. Lt Col Barelka's research interests include virtual collaboration, leadership, and social influence. Tel. 937-255-3636 x7404 (DSN 785-3636 x7404), email: [Alexander.Barelka@afit.edu](mailto:Alexander.Barelka@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

"The Influence of Pop-Culture IT- New Media Project." Sponsor: 711 HPW/RH. Funding: \$275,000.

"Individual and Team Level IT Suspicion." Sponsor: AFOSR. Funding: \$99,336.

#### **BLECKMANN, CHARLES A.,**

Professor of Environmental Management, Department of Systems and Engineering Management, AFIT Appointment Date: 1993 (AFIT/ENV); BA, Secondary Education (Biology), University of Evansville, 1967; MS, Biology, Incarnate Word College, 1971; PhD, Botany, University of Arizona, 1977. Dr. Bleckmann's research interests include water and wastewater analyses and treatment, land treatment of wastes, groundwater remediation, biodegradation of organics, fuels microbiology, and bioweapons. Tel. 937-255-3636 x4721 (DSN 785-3636 x4721), email: [Charles.Bleckmann@afit.edu](mailto:Charles.Bleckmann@afit.edu)

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Mattei, D.I., C. A. Bleckmann, D. J. Bunker, I. Maxis. 2009 "The Use of Spider Webs as Passive Bioaerosol Collectors. SPIE Defense, Security, and Sensing 2009." Orlando World Center Marriott Resort & Convention Center, Orlando, FL. 14-17 April 2009.

Mattei, D.I., C.A. Bleckmann, D. J. Bunker, A.L. Rypstra. 2008. "Spider Webs as Passive Air Samplers." Advanced Signatures Technology Symposium, Charlottesville, VA.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Bleckmann, C. A. 2009. "Jet Fuel Microbiology." Invited lecture. Society for Industrial Microbiology, Southern Great Lakes Section Annual Meeting, Ball State University, Muncie, IN. 7 November.

Journal Reviewer for: Journal of Environmental Engineering, Science of the Total Environment, and Environmental Engineering Science.

#### **COLOMBI, JOHN M.,**

Assistant Professor of Systems Engineering, Department of Systems and Engineering Management, AFIT  
Appointment Date: 2008 (AFIT/ENV), Faculty Scholar-in-Residence, AF Center for Systems Engineering.  
BSEE, University of Lowell, MA, 1986; MSEE, Air Force Institute of Technology, 1992; PhD, Air Force  
Institute of Technology, 1996. Dr. Colombi's research interests include Systems Engineering and  
Architecture, interoperability measurement, complex adaptive systems theory and human-systems  
integration.. Tel. 937-255-3535 x3347 (DSN 785-3535 x3347), email: [John.Colombi@afit.edu](mailto:John.Colombi@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

"Human System Integration (HSI) Architectural and Empirical Methods." Sponsor: 711 HPW/RH. Funding: \$30,000. [CSE]

#### REFEREED JOURNAL PUBLICATIONS

Thomas C. Ford, John M. Colombi, David R. Jacques and Scott R. Graham, "A General Method of Measuring Interoperability and Describing Its Impact on Operational Effectiveness," The Journal of Defense Modeling and Simulation: Applications, Methodology, Technology, Vol. 6, No. 1, pp. 17-32, 2009.

Thomas C. Ford, John M. Colombi, David R. Jacques and Scott R. Graham. "On the Application of Classification Concepts to Systems Engineering Design and Evaluation." Journal of Systems Engineering. Volume 12 Issue 2, 2009, pp. 141-154.

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Adam Lenfestey, Eric Cring and John Colombi, "Architecting Human Operator Trust in Automation for Multiple Unmanned Aerial System (UAS) Control." Proceedings of the 2009 International Conference on Software Engineering Research and Practice (SERP'09), July 13-16, 2009.

Nicholas Hardman, John Colombi, David Jacques, Raymond Hill and Janet Miller. "Application of Seeded Hybrid Genetic Algorithm for User Interface Design." Presentation and Proceedings of the IEEE Systems Man and Cybernetics Conference, San Antonio, 2009.

Peter Mastro, Richard Orcutt, David Jacques and John Colombi, "Enterprise Architecture Support for Capability Based Assessments." Presentation and Proceedings of the Conference on Systems Engineering Research, Loughborough, England, April 2009.



Nicholas Hardman, John Colombi, David Jacques, Raymond Hill and Janet Miller. "Persons in the Processes: Human Systems Integration in Early System Development." Presentation and Proceedings of the International Council on Systems Engineering Conference, Singapore, June 2009.

Nicholas Hardman, John Colombi, David Jacques, Raymond Hill and Janet Miller. "The Challenges of Human Considerations in the Systems Engineering Technical Process." Presentation and Proceedings of the Conference on Systems Engineering Research, Loughborough, England, April 2009.

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

John Colombi, David Jacques and Richard Cobb. "System of Systems Challenges and Solutions." National Reconnaissance Organization (NRO) Annual Systems Engineering Symposium. Invited Speaker. Aug 2009.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Karen S. Bausman and John Colombi. "The Future of Systems Engineering." Defense AT&L, DAU Press. pp. 38-42, January-February 2009.

#### **ELSHAW, J. JOHN, Lt Col,**

Instructor of Management; BS, Accounting, University of Akron, 1991; MBA, Regis University, 1996, Doctoral Candidate, Krannert School of Management, Purdue University, 2008. Lt Col Elshaw's research interests include organizational behavior, 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, hierarchical linear modeling. Tel. 937-255-3636 x4574 (DSN 785-3636 x4574), email: [John.Elshaw@afit.edu](mailto:John.Elshaw@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

"Unintended and Indirect Effects of Social Network Sites." Sponsor: 711 HPW/RH. Funding: \$120,000.

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Academy of Management: 2009 Conference, Chicago, Illinois: "Virtualness and Organizational Climate: A Multi-level Study Examining Trust Development."

#### **FASS, R. DAVID, Lt Col,**

Assistant Professor of Management; BS, Economics, University of New Mexico, 1989; MBA, University of New Mexico, 1993, PhD, College of Business, Department of Management, New Mexico State University, 2007. His research interests include strategic management, organizational behavior, organizational development and change, government contracting, multilateral alliances ("constellations"), Austrian economics, prescriptive vs. descriptive research models, social network methods, structural equation modeling, transcendent goals, and enriching web-based learning. Tel. 937-255-3636 x4826 (DSN 785-3636 x4826), email: [Robert.Fass@afit.edu](mailto:Robert.Fass@afit.edu)

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Invited by the Organization Development & Change Division Executive Committee to review symposia proposals for the 2009 Academy of Management Conference.

**FENG, PETER P., Maj,**

Assistant Professor, Department of Systems and Engineering Management, AFIT Appointment Date: 2009 (AFIT/ENV); BS, Civil Engineering, University of New Hampshire, NH 1996; MS, Engineering and Environmental Management, Air Force Institute of Technology, Wright-Patterson AFB, OH, 2000; Ph.D., Civil and Environmental Engineering, University of California, Berkeley, CA, 2009. Maj Feng's research interests include Lean Theory and its application to facility design and construction, contingency construction management, construction management, decision analysis, sustainability, life cycle assessment, and discrete event simulation. Tel. 937-255-3636 x4648 (DSN 785-3636 x4648), email: [peter.feng@afit.edu](mailto:peter.feng@afit.edu)

**REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW**

Feng, P.P., and Tommelein, I.D. (2009). "Causes of Rework in California Hospital Design and Permitting: Augmenting an Existing Taxonomy." Proceedings of the 17<sup>th</sup> Annual Conference of the International Group Lean Construction (IGLC 17), 15-17 July, Taiwan, ROC.

Feng, P.P., and Tommelein, I.D. (2009). "Modeling the Effect of Alternative Review Processes: Case Study of a State Permitting Agency." Proceedings of the Construction Research Congress, 5 -7 April, Seattle, USA.

**GOLTZ, MARK N.,**

Professor of Engineering and Environmental Management, Department of Systems and Engineering Management, AFIT Appointment Date: 1996 (AFIT/ENV); BS, Cornell University, 1972; MS, University of California, Berkeley, 1973; PhD, Environmental Engineering and Science, Stanford University, 1986. Dr. Goltz specializes in modeling the physical, chemical, and biological processes that affect the fate and transport of organic contaminants in the subsurface. He is also interested in the implementation and commercialization of innovative groundwater remediation technologies. Tel. 937-255-3636 x4638 (DSN 785-3636 x4638), email: [Mark.Goltz@afit.edu](mailto:Mark.Goltz@afit.edu)

**REFEREED JOURNAL PUBLICATIONS**

Goltz, M.N., M.E. Close, H. Yoon, J. Huang, M.J. Flintoft, S.J. Kim, C. Enfield, Validation of Two Innovative Methods to Measure Contaminant Mass Flux in Groundwater, *J Contaminant Hydrology*, 106:51-61, 2009.

Wu, M.Y., K.M. Smits, M.N. Goltz, J.A. Christ, A Simple Model for Injection-Extraction Treatment Well Recirculation System Design, *Ground Water Monitoring & Remediation*, 28(4):63-71, 2008.

**REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW**

Goltz, M.N. and J. Huang, "Applying Groundwater Contaminant Flux Measurement Methods to Assess Pathogen Transport," First International Conference on Microbial Transport and Survival in Porous Media, Niagara-on-the-Lake, Ontario, Canada, 10-13 May 2009.

Goltz, M.N., J. Wheeldon, A. Hylko, M. Brooks, L. Wood, A. Thal, and S. Leach, "An Evaluation and Implementation Guide for Groundwater Contaminant Mass Flux Measurement Methods," Partners in Environmental Technology Technical Symposium and Workshop, Washington DC, 2-4 December 2008.

Henderson, T., C.C. Lutes, D.S. Liles, T. Peschman, J. Graham, S. Marshall, F. Cannon, J. Patterson, R. Parette, M.N. Goltz, D. Craig, and D. Felker, "Tailored Granular Activated Carbon for Well-Head Perchlorate Treatment," Partners in Environmental Technology Technical Symposium and Workshop, Washington DC, 2-4 December 2008.

**GRMAILA, MICHAEL R.,**

Associate Professor of Information Resource Management, Department of Systems Engineering and Management, AFIT Appointment Date: 2004 (AFIT/ENV); Center for Cyberspace Research (CCR), BS, Texas A&M University, 1993; MS, Texas A&M University, 1995; PhD, Texas A&M University, 1999. Dr. Grimaila's research interests include data mining, information assurance, information engineering, information operations, and information warfare. Tel. 937-255-3636 x4800 (DSN 785-3636 x4800), email: [Michael.Grimaila@afit.edu](mailto:Michael.Grimaila@afit.edu)

**SPONSOR FUNDED RESEARCH PROJECTS**

"Foundational Research for the Development of a Cyber Incident Mission Impact Assessment (CIMIA) Process." Sponsor: 711 HPW/RH. Funding: \$280,000. [CCR]

"Insider Threat Detection Using Web Server Log Files." Sponsor: NSA. Funding: \$10,000. [CCR]

**REFEREED JOURNAL PUBLICATIONS**

Ward, D. and Grimaila, M.R., "Who Shall Defend Us? Determining National Defense Roles in the Internet Age," The Information System Security Association (ISSA) Journal, March 2009, pp. 10-16.

Kelly, D, Raines, R., Baldwin, R., Mullins, B., and Grimaila, M.R., "Evolving Issues in Next-Generation Wireless Anonymous Networks," Security and Communication Networks, February 2009.

Marsh, D.W., Baldwin, R.O., Mullins, B.E., Mills, R.F., and Grimaila, M.R., "A Security Policy Language for Wireless Sensor Networks," Journal of Systems and Software, January 2009, Vol. 82, No. 1, pp. 101-111.

**REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW**

McDonald, T.J., Kim, Y.C., and Grimaila, M.R., "Protecting Reprogrammable Hardware with Polymorphic Circuit Variation," Proceedings of the 2nd Cyberspace Research Workshop, Shreveport, LA, June 15, 2009.

Grimaila, M.R., Fortson, L.W., and Sutton, J.L., "Design Considerations for a Cyber Incident Mission Impact Assessment (CIMIA) Process," Proceedings of the 2009 International Conference on Security and Management (SAM09), Las Vegas, Nevada, July 13-16, 2009.

Grimaila, M.R., Schechtman, G., and Mills, R.F., "Improving Cyber Incident Notification in Military Operations," Proceedings of the 2009 Institute of Industrial Engineers Annual Conference, Miami, FL, May 30, 2009 - June 3, 2009.

Kelly, D., Raines, R., Baldwin, R., Mullins, B., and Grimaila, M.R., "Towards a Taxonomy of Wired and Wireless Anonymous Networks," IEEE International Communications Conference 2009, Dresden Germany, June 2009.

Grimaila, M.R., Fortson, L.W., Sutton, J.L., and Mills, R.F., "Developing Methods for Timely and Relevant Mission Impact Estimation," Proceedings of the 2009 SPIE Defense, Security and Sensing Conference (SPIE DSS 2009), Orlando, Florida, April 13-17, 2009.

Moore, T.W. , Grimaila, M.R., and Strouble, D., "Laws and Regulations of USAF Military Operations in Cyberspace," Proceedings of the 2009 International Conference on Information Warfare and Security (ICIW 2008), University of Cape Town, Breakwater Campus, Cape Town, South Africa, 26-27 March 2009.

Kelly, D., Raines, R., Baldwin, R., Mullins, B., and Grimaila, M.R., "Towards a Tree-based Taxonomy of Anonymous Networks," Proceedings of the 6th Annual IEEE Consumer Communications & Networking Conference (CCNC), pp. 1-2, Las Vegas, NV, January 2009.

Kelly, D., Raines, R., Baldwin, R., Mullins, B., and Grimaila, M.R., "Towards Mathematically Modeling the Anonymity Reasoning Ability of an Adversary," Proceedings of the IEEE IPCCC International Workshop on Information and Data Assurance (WIDA), Austin, TX, December 2008.

Kelly, D., Raines, R., Grimaila, M.R., Baldwin, R., and Mullins, B., "A Survey of the State-of-the-Art in Anonymity Metrics," Proceedings of the 1st ACM Workshop on Network Data Anonymization (NDA), pp. 31-40, George Mason University, Alexandria, VA., October 2008.

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Myers, J., Grimaila, M.R., and Mills, R.F., "Towards Insider Threat Detection using Web Server Logs," Proceedings of the Cyber Security and Information Intelligence Research Workshop (CSIIRW 2009), Oak Ridge National Laboratory, Oak Ridge, TN, April 13-15, 2009.

#### BOOKS AND CHAPTERS IN BOOKS

Mills, R.F., Peterson, G.L., and Grimaila, M.R., "Insider Threat Prevention, Detection, and Mitigation," *Cyber-Security and Global Information Assurance: Threat Analysis and Response Solutions*, K. Knapp, ed., IGI Global Publishing, March 2009, pp. 48-74 [CCR]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Appointed Research Fellow in the Air Force Center for Systems Engineering.

Workshop Chair for the OSD/NII STEP Workshop; "Limiting the Ability of Adversaries to Act from within our Network"; JHU-APL, MD; June 30, 2009.

Invited Speaker at the DOD CND R&T Workshop, "Cyber Incident Mission Impact Assessment: A Paradigm Shift in the Way We Account for Mission-Information Risk," Linthicum, MD; June 22-24, 2009.

Keynote Speaker at the IEEE Intelligence and Security Informatics (ISI) conference, "Towards a Timely and Relevant Cyber Incident Mission Impact Assessment Capability," Richardson, TX; June 8-11, 2009.

Invited Speaker at the GSC Department of Defense-Intelligence Community-Financial Sector Forum, "Insider Threat Detection," National Security Agency, Fort Meade, MD, October 15, 2008.

Editorial Board Member of the Information System Security Association (ISSA) Journal.

Editorial Advisory Board Member for the Cyber-Security and Global Information Assurance: Threat Analysis and Response Solutions Book.

Reviewer for Military Operations Research Society Journal and the Behavior & Information Technology Journal.

Technology Consultant for the Air Force Radiation Assessment Team (AFRAT), Brooks City Base, San Antonio, TX.

Consultant for the Air Force Research Laboratory – Cyberspace & Information Operations Programs.

**HASTY, BRYAN R., Maj,**

Instructor, Department of Systems & Engineering; Military Visiting Fellow to the U.S. Air Force Center for Systems Engineering. M.B. (2007), Business, Indiana University, Bloomington, IN; M.S. (1998), Information Resource Management, Air Force Institute of Technology, School of Systems and Logistics, Wright-Patterson AFB, OH; M.S. (1996), Information Systems Management, Louisiana State University, Shreveport, LA; B.S. cum laude (1991), Computer Science, Northern Michigan University, Marquette, MI. Tel. 937-255-3636 x44605 (DSN 785-3636 x4605), email: [Bryan.Hasty@afit.edu](mailto:Bryan.Hasty@afit.edu)

**HEMINGER, ALAN R.,**

Associate Professor, Department of Systems and Engineering Management, AFIT Appointment Date: 1994 (AFIT/ENV); BA, Philosophy, University of Michigan, 1966; MS, Educational Psychology, California State University at Hayward, 1978; PhD, Management Information Systems, University of Arizona, 1988. Dr. Heminger's research interests include information integration, strategic information management, computer supported group problem-solving, reengineering, and long-term access to information. Tel. 937-255-3636 x7405 (DSN 785-3636 x7405), email: [Alan.Heminger@afit.edu](mailto:Alan.Heminger@afit.edu)

**SPONSOR FUNDED RESEARCH PROJECTS**

"Supporting a Process View of Work at the Defense Ammunition Center." Sponsor: Defense Ammunition Center. Funding: \$96,332. [CSE]

**HOLT, DANIEL T., Lt Col,**

Associate Professor of Management, Department of Systems and Engineering Management, AFIT Appointment Date: 2002 (AFIT/ENV); BS, Electrical Engineering, University of Louisville, 1989; MA, Human Resource Development, Webster University, 1993; MS, Air Force Institute of Technology, 1995; and, PhD, Management Auburn, 2002. Lt Col Holt's research interests include organizational change, organizational development, human resource management, and attitude measurement.

**REFEREED JOURNAL PUBLICATIONS**

Rutherford, M. W., Kuratko, D. F., & Holt, D. T. (2008). The family business theory jungle: Competing theories on "familiness" and performance. *Entrepreneurship Theory & Practice*, 32(6), 1089-1109.

**REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW**

Rehg, M. T., Holt, D. T., Williams, D. J., & Toney, R. P. (2009). Work environment effects on training transfer: A meta-analysis. Paper presented at the annual meeting of the Academy of Management, Chicago, IL, August 7 – 11.

**BOOKS AND CHAPTERS IN BOOKS**

Holt, D. T. (2009). Measuring Readiness for BPM: Insights from Corporate Entrepreneurship and Organizational Change Research (pp. 17-24). In L. Fischer (Ed.), *2009 BPM and Workflow Handbook: Methods, Concepts, Case Studies and Standards in Business Process Management and Workflow*. Lighthouse Point, FL: Future Strategies Inc.

**OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES**

Holt, D. T., Dorey, E. L., Bailey, L. C., & Low, B. R. (2009). Recovering when a change initiative stalls: Correcting implementation mistakes. *OD Practitioner*, 41(1), 14-18.

Heilmann, S. G., Holt, D. T., Phelps, J. A., & Leach, S. E. (2008). Moderating effects of perceived organizational support on the relationship between job satisfaction and turnover intentions for recently retrained USAF enlisted members. *Journal of Business & Behavioral Sciences*, 19(1), 43-56.

**JACQUES, DAVID R.,**

Associate Professor of Aerospace Engineering, Department of Systems and Engineering Management, AFIT. Appointment Date: 1999 (AFIT/ENY); 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. Tel. 937-255-3636 x3329 (DSN 785-3636 x3329), email: [David.Jacques@afit.edu](mailto:David.Jacques@afit.edu)

**SPONSOR FUNDED RESEARCH PROJECTS**

"Tailored Application of Systems Engineering for Rapid Prototyping and Transition." Sponsor: SAF. Funding: \$25,000. [CSE]

**SPONSOR FUNDED EDUCATIONAL PROJECTS**

"Space System Engineering Case Studies." Sponsor: SAF. Funding: \$60,000. [CSE]

**REFEREED JOURNAL PUBLICATIONS**

Ford T., J. Colombi, D. Jacques and S. Graham, "On the Application of Classification Concepts to Systems Engineering Design and Evaluation," *Journal of Systems Engineering*, Volume 12 Issue 2, 2009. pg141-154.

Colombi J, D. Jacques and D. Strouble, "Maximizing Warfighter Capability using Surveyed Necessity Measurement: Application to the USAF F-15C Fleet," *Defense Acquisition Review Journal*, Vol.15, #3, Dec 2008.

Jacques, D., J. Bode and M. Pachter, "Optimization of an Autonomous Weapon's Operating Characteristics," *IEEE Systems Journal*, May 2009.

**REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW**

Nicholas Hardman, John Colombi, David Jacques, Raymond Hill and Janet Miller. Persons in the Processes: Human Systems Integration in Early System Development. *Presentation and Proceedings of the International Council on Systems Engineering Conference*, Singapore, June 2009.

**REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW**

Stephen M. Behm, J. Bradford Pitzer, Jane White, David R. Jacques and James R. Malas, "Tailorable Systems Engineering Framework for Science and Technology Projects," Conference on Systems Engineering Research, Loughborough, UK, April 2009.

Peter C. Mastro, Richard L. Orcutt, David R. Jacques and John M. Colombi, "Enterprise Architecture Support for Capability Based Assessment," Conference on Systems Engineering Research, Loughborough, UK, April 2009.

Amie C. Stryker and David R. Jacques, "Modularity versus Functionality – A Survey and Application," Conference on Systems Engineering Research, Loughborough, UK, April 2009.

Nicholas Hardman, John Colombi, David Jacques, Raymond Hill and Janet Miller, "The Challenges of Human Considerations in the Systems Engineering Technical Process," Conference on Systems Engineering Research, Loughborough, UK, April 2009.

#### BOOKS AND CHAPTERS IN BOOKS

Bode J., D. Jacques and M. Pachter, "Optimal Control of the Weapon Operating Characteristic with Control Inequality Constraints," *Optimization and Cooperative Control Strategies*, Springer Lecture Notes in Computer Science, 2008.

#### **LONG, DAVID. S., Lt Col,**

Instructor, Department of Systems and Engineering Management, AFIT Appointment Date: 2009 (AFIT/ENV); BS, Industrial Engineering and Management, North Dakota State University, ND 1988; MS, Engineering, California State University (Northridge), Northridge, CA, 1997; Ph.D. (projected), Engineering Systems, Massachusetts Institute of Technology, Cambridge, MA, 2010 (projected). Lt Col Long's research interests include system architecture, commonality and modularity, system acquisition, human interfaces, and manned/unmanned aircraft systems. Tel. 937-255-3636 x4651 (DSN 785-3636 x7402), email:

[David.Long@afit.edu](mailto:David.Long@afit.edu)

#### REFEREED JOURNAL PUBLICATIONS

Geoffrey Carrigan, David Long, ML Cummings, John Duffner, "Technical briefing: Diagnosing an accident," C4ISR Journal, November 1, 2008.

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

"Finding opportunities for commonality in complex systems," International Conference on Engineering Design 2009, August 2009.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Reviewer for International Conference on Engineering Design 2009.

Advisory Board Member, North Dakota State University Industrial Engineering and Management Department. Curriculum development and recruiting committees.

Presented methodology to assist UAV community to meet OSD's mandate for commonality.

#### **MUCZYK, JAN P.,**

Professor Emeritus of Management, Department of Systems and Engineering Management, AFIT Appointment Date: 1995 (AFIT/ENV). BS, MBA, and DBA, University of Maryland in Management and Organizational Behavior. Dr. Muczyk's research interests include leadership, streamlining bureaucracies, and strategy implementation.

#### **PEACHEY, TODD A., Maj,**

Assistant Professor of Information Resource Management, Department of Systems and Engineering Management, AFIT Appointment Date: 2006 (AFIT/ENV). BS in Finance, Penn State, 1992; MS in Information of Resource Management, Air Force Institute of Technology, Dayton, OH, 1998; PhD in Management of Information Technology and Innovation, Auburn, 2006. Major Peachey's research interests include information systems strategic alignment and knowledge management. Tel. 937-255-3636 x7391 (DSN 785-3636 x7391), email: [Todd.Peachey@afit.edu](mailto:Todd.Peachey@afit.edu)



**SCHECHTMAN, GREGORY M., Lt Col,**

Assistant Professor of Information Resource Management, Department of Systems and Engineering Management, AFIT Appointment Date: 2008 (AFIT/ENV). BS in Finance, Florida State University, 1990; MS in Information of Resource Management, Air Force Institute of Technology, Dayton, OH, 1996; PhD in Business Administration concentrating in Management Information Systems, Washington State University, 2009. Lt Col Schechtman's research interests include virtual collaboration, human computer interaction, and information security. Tel. 937-255-3636 x4709 (DSN 785-3636 x4709), email:

[Gregory.Schechtman@afit.edu](mailto:Gregory.Schechtman@afit.edu)

**SHELLEY, MICHAEL L.,**

Professor of Environmental Science and Engineering, Department of Systems and Engineering Management, AFIT Appointment Date: 1996 (AFIT/ENV); BCE (Civil Engineering), Auburn University, 1974; MS (Environmental Engineering), Virginia Tech, 1975; PhD, Environmental Science and Engineering, University of North Carolina, 1985. Dr. Shelley focuses on system dynamics modeling in analyzing long-term management strategies. His research interests include abiotic and biochemical contaminant fate and transport, physiologically-based pharmacokinetic modeling, and ecological engineering design to optimize mission activity with environmental constraints. Tel. 937-255-3636 x7387 (DSN 785-3636 x7387), email:

[Michael.Shelley@afit.edu](mailto:Michael.Shelley@afit.edu)

**REFEREED JOURNAL PUBLICATIONS**

Shelley, Wagner, Hussain, and Bleckmann, "Modeling the *in vivo* case with *in vitro* nanotoxicity data," *International Journal of Toxicology* 27, pp. 1-9, 2008.

**SITZABEE, WILLIAM, E., Lt Col,**

Assistant Professor, Department of Systems and Engineering Management, AFIT Appointment Date: Jun 2009 (AFIT/ENV); BS, Civil Engineering, Norwich University, VT, 1993; MS, Engineering Management, Air Force Institute of Technology, Wright-Patterson AFB, OH, Mar 2004; Ph.D., Civil Engineering, North Carolina State University, NC, 2008. Lt Col Sitzabee's research interests include construction management, transportation asset management, geographical information systems, facility and infrastructure operations. Tel. 937-255-3636 x7395 (DSN 785-3636 x7395), email: [William.sitzabee@afit.edu](mailto:William.sitzabee@afit.edu)

**SLAGLEY, JEREMY M., Maj,**

Assistant Professor of Industrial Hygiene, Department of Systems and Engineering Management, AFIT Appointment Date: 2006 (AFIT/ENV); BA, Environmental Engineering, US Military Academy, 1993; MS in Industrial Hygiene, University of Iowa, 2000; Ph.D., Occupational Safety and Health, West Virginia University, 2006. Maj Slagley's research interests include engineering controls for noise and airborne hazards, aerosol measurement, and exposure assessment. Tel. 937-255-3636 x4511 (DSN 785-3636 x4511), email [Jeremy.Slagley@afit.edu](mailto:Jeremy.Slagley@afit.edu)

**SMITH, DAVID A., Lt Col,**

Assistant Professor of Environmental Science and Engineering, AFIT Appointment Date: 2006 (AFIT/ENV); B.A. (Mathematics/Secondary Education), Central Methodist College, 1986; MS (Nuclear Engineering (Health Physics)), University of Missouri - Columbia, 1990; MS (Nuclear and Radiological Engineering (Diagnostic Medical Physics)), 1997, University of Florida -Gainesville; PhD (Environmental Sciences), 2006, The Ohio State University. Lt Col Smith's research interests include Chemical, Biological, Radiological, and Nuclear (CBRN) response (medical, equipment and communication integration), CBRN detection, assessment of ecological and human health effects of weapons of mass destruction. Tel. 937-255-3636 x 4711 (DSN 785-3636 x 4711), email: [David.A.Smith@afit.edu](mailto:David.A.Smith@afit.edu)



#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Badiru, A.B., Slagley, J.M., and Smith, D.A. (2009). "Project Life Cycle Model for ABET Site Visit Preparation." ABET Best Assessment Processes XI Symposium, Indianapolis, Indiana, USA, April 3-4, 2009.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Hosted 3<sup>rd</sup> annual AFIT/WSU CBRNE Research, Education and Collaboration Symposium, 22-23 Sep 2009.

#### **SONI, SOM R.,**

Associate Professor of Systems Engineering, BS (Hons), Punjab University, 1967; MS, University of Roorkee (renamed as IIT Roorkee) India, 1969; PhD, University of Roorkee (renamed as IIT Roorkee) India, 1972. Teaching and research related to systems engineering design, analytical and experimental mechanics of composite materials and structures. Tel. 937-255-3355 x 3420 (DSN 785-3355 x 3420), email:

[Som.Soni@afit.edu](mailto:Som.Soni@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

"Composite Materials and Technology Airframe Cost Comparison." Sponsor: AFRL/RB. Funding: \$12,500. [CSE]

"Intermediate Strain Rate Investigation of Fiber Metal Laminates." Sponsor: AFRL/RB. Funding: \$7,000. [CSE]

"Validation of Damage Through Inspection of Composite Joints with Z-Pins." Sponsor: DAGSI. Funding: \$20,000. [CSE]

#### REFEREED JOURNAL PUBLICATIONS

Jeffrey D. Kuhn and Som R. Soni, "A Design of Experiments Approach to Determining Structural Health Monitoring Sensor Durability." Int. J. of Structural Longevity, TechScience Publications, Vol 1, no. 1, pp. 61-73, 2009.

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Soni, S.R. "AFOSR program and an example Analysis of Co-cured bonded Joints project," 5<sup>th</sup> International Congress of Materials, Cali, Colombia, October 12-16, 2009.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Facilitated a collaboration between SOARD and AFIT and helped establish a collaborative project with the Colombian Institute. International Collaboration with Colombian Air Force has reached a level where AFRL/AFOSR has made an award to Colombian Air Force Academy, Cali, to work on "Analysis of Co-Cured Bonded Joints" for three years, for \$75,000.

Interacted with Colombian Air Force leadership to help secure a foreign military funding of \$180,000 to send a Colombian Officer to AFIT for MS Systems Engineering program in August 2010.

Invited and funded Mr. Hitesh Kapoor, a Visiting Scientist from Virginia Tech, under collaboration with Wyle Laboratories and DAGSI. Mr. Kapoor has worked at AFIT conducting research in the topic of Failure Mechanisms in Composite Co-cured Joints.

**THAL, ALFRED E., Jr.,**

Assistant Professor of Engineering Management, Department of Systems and Engineering 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 (DSN 785-3636 x7401), email: [Al.Thal@afit.edu](mailto:Al.Thal@afit.edu)

**SPONSOR FUNDED RESEARCH PROJECTS**

"Effectiveness of the International Military Education and Training Program." Sponsor: DISAM. Funding: \$33,040.

**REFEREED JOURNAL PUBLICATIONS**

Rosner, J.W., A.E. Thal, Jr., and C.J. West, "An Analysis of the Design-Build Delivery Method in Air Force Military Construction," *Journal of Construction Engineering and Management*, 135(8):710-717, 2009.

**REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW**

Hammond, G.D., D.C. Vitale, and A.E. Thal, Jr., "Perceived Need for Organizational Change: A Test of Individual Emotion and Contextual Influences," Academy of Management 2009 Annual Meeting, Chicago, Illinois, August 7-11, 2009.

Mills, C.E., J.W. Osgood, A.E. Thal, Jr., J.D. Havlicek, "Development of a Value-Focused Architectural Scorecard for a Joint Force Protection System," Industrial Engineering Research Conference, Miami, Florida, May 30-June 3, 2009.

Cotton, L.D., G.A. Haase, J.D. Havlicek, and A.E. Thal, Jr., "Value-Driven Enterprise Architecture Score (VDEA-Score): A Means of DoDAF Architecture Evaluation," Conference on Systems Engineering Research, Loughborough University, United Kingdom, 20-23 April 2009.

Cook, J.J., A.E. Thal, Jr., and Edward D. White III, "Estimating Required Contingency Funds for Construction Projects Using Multiple Linear Regression," Decision Sciences Institute Annual Meeting, Baltimore, Maryland, November 22-25, 2008.

**REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW**

Goehring, S.W., and A.E. Thal, Jr., "An Analysis of Competencies for Program Managers in the Department of Defense," Decision Sciences Institute Annual Meeting, Baltimore, Maryland, November 22-25, 2008.

Griffin, J.S., and A.E. Thal, Jr., "Developing a Better Understanding of Energy Consumption Factors and Trends," Decision Sciences Institute Annual Meeting, Baltimore, Maryland, November 22-25, 2008.

**TURNER JASON M., Maj,**

Assistant Professor of Information Resource Management, AFIT Appointment Date: 2006 (AFIT/ENV); BS, Industrial Psychology, University of Wisconsin, Madison, WI, 1992; MS, Information of Resource Management, Air Force Institute of Technology, Dayton, OH, 1997; PhD, Information Science, University of Texas, Austin, TX, 2006. Maj Turner's research interests include human factors/HCI, interface design and usability, and the social and organizational uses of information and information technology and their impacts on interpersonal communication; individual and collaborative decision-making; and collocated, virtual, and distributed work processes. Tel. 937-255-3636 x7407 (DSN 785-3636 x7407), email: [Jason.Turner@afit.edu](mailto:Jason.Turner@afit.edu)

**UNGER, ERIC J., Lt Col,**

Assistant Professor, Department of Systems and Engineering Management, AFIT Appointment Date: 2007 (AFIT/ENV); BA, Mathematics and Economics, Northwestern University, IL 1990; MS, Acquisition Management, Air Force Institute of Technology, Wright-Patterson AFB, OH, 2001; Ph.D., Policy Analysis, Pardee RAND Graduate School, CA, 2007. Lt Col Unger's research interests include econometric analysis of financial data, operations and maintenance (O&M) and operations and support (O&S) costs analysis, research and development cost estimation, and cost per flying hour analysis. Tel. 937-255-3636 x7402 (DSN 785-3636 x7402), email: [Eric.Unger@afit.edu](mailto:Eric.Unger@afit.edu)

**WIRTHLIN, J. ROBERT, Lt Col,**

Assistant Professor, Department of Systems and Engineering Management, AFIT Appointment Date: 2009 (AFIT/ENV); BA, Engineering Sciences, The United States Air Force Academy, CO 1994; MS, Engineering and Management, Massachusetts Institute of Technology, MA 2000; Ph.D., Engineering Systems, Massachusetts Institute of Technology, MA, 2009. Lt Col Wirthlin's research interests include weapon system acquisition management, research and development management, risk management, product development, new product development, and systems engineering. Tel: 937-255-3636 x4650 (DSN 785-3636 x4650), email: [joseph.wirthlin@afit.edu](mailto:joseph.wirthlin@afit.edu)

**OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES**

NRO short-course class taught at Chantilly, VA location: Requirements Engineering, September 2009.

Reviewer for International Conference on Engineering Design (ICED) Conference (Aug 24-27, 2009, Stanford, CA).

Named to Editorial Board of Journal of Enterprise Transformation.

Invited Talk: Identifying Enterprise Leverage Points in Defense Acquisition Program Performance, *Presented at the Lean Advancement Initiative 2009 Research Summit.*

Research reviewed at two MIT Engineering Systems Division (ESD) poster sessions, and MIT ESD Board of Visitors Conference.

## **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 department.

## **6.1. ADVANCED NAVIGATION TECHNOLOGY CENTER**

### **Advanced Navigation Technology Center (ANT)**

Director 255-3636 x4580

Executive Program Coordinator 255-3636 x4583

Laboratory Manager 255-3636 x4911

Homepage: <http://www.afit.edu/en/ant>

### **FACULTY RESEARCH OUTPUT**

\*Faculty Bios can be found under their respective department listings.

#### **COBB, RICHARD G., Department of Aeronautics and Astronautics**

##### SPONSOR FUNDED RESEARCH PROJECTS

"Planning, Guidance and Control for Multiple UAV Cooperative Operations." Sponsor: AFRL/RB. Funding: \$20,000. [ANT]

#### **MARTIN, RICHARD K., Department of Electrical and Computer Engineering**

##### SPONSOR FUNDED RESEARCH PROJECTS

"Technical Support: Navigation via Signals of Opportunity." Sponsor: AFRL/RV. Funding: \$15,000. [ANT]

#### **PACHTER, MEIR, Department of Electrical and Computer Engineering**

##### SPONSOR FUNDED RESEARCH PROJECTS

"New Navigation Techniques." Sponsor: AFRL/RV. Funding: \$15,000. [ANT]

#### **PETERSON, GILBERT L., Department of Electrical and Computer Engineering**

##### SPONSOR FUNDED RESEARCH PROJECTS

"INSeCT: Intelligent Navigation and Sensing Cooperative Tasks." Sponsor: AFRL/RV. Funding: \$100,000. [ANT]

"Semi-Autonomous Lead Vehicle for Convoy Operations." Sponsor: JIEDDO. Funding: \$100,000. [ANT]

##### REFEREED JOURNAL PUBLICATIONS

Woolley, B., Peterson, G.L., "Unified Behavior Framework for Reactive Robot Control," *Journal of Intelligent and Robotic Systems*, vol. 55, no. 2, pp.155-176, 2009. [ANT]

##### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Hooper, D., and Peterson, G.L., "HAMR: A Hybrid Multi-Robot Control Architecture," *The 22<sup>nd</sup> International FLAIRS Conference*, Sanibel Island, FL, May 2009, pp. 139-140. [ANT]

Boxerbaum, A., Oro, J., Peterson, G.L., Quinn R.D., "The Latest Generation Whegs™ Robot Features a Passive-Compliant Body Joint," *2008 IEEE/RSJ International Conference on Intelligent Robots and Systems*, pp. 1636-1641. [ANT]

**RAQUET, JOHN F., Department of Electrical and Computer Engineering**

**SPONSOR FUNDED RESEARCH PROJECTS**

"ANT Center and Laboratory Support per Appendix of the MOA between AFIT and AFRL." Sponsor: AFRL/RV. Funding: \$200,000. [ANT]

"Development of High Accuracy TSPI Systems." Sponsor: 746 TSS/XPR. Funding: 45,900. [ANT]

"GNSS Software Receiver Research." Sponsor: AFSPC GPS Wing. Funding: \$75,000. [ANT]

"Navigation Systems Integration." Sponsor: SSC PACIFIC. Funding: \$10,000. [ANT]

"Non-GPS Navigation Using Radio-Based Ranging Combined with Additional Sensors." Sponsor: Raytheon. Funding: \$100,000. [ANT]

"Support for RSN and SSN Programs." Sponsor: DARPA. Funding: \$20,035. [ANT]

**REFEREED JOURNAL PUBLICATIONS**

R. K. Martin, J. S. Velotta, and J. F. Raquet, "Bandwidth Efficient Cooperative TDOA Computation for Multicarrier Signals of Opportunity," IEEE Trans. on Signal Processing, vol. 57, no. 6, June 2009, pp. 2311-2322. [ANT]

**REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW**

Morrison, J., J. Raquet, and M. Veth, "Performance Evaluation of Vision Aided Inertial Navigation System Augmented with a Coded Aperture," Proceedings of ION International Technical Meeting, Anaheim, CA, January 2009. [ANT]

Crosby, J., R. K. Martin, J. Raquet, and M. Veth, "Fusion of Inertial Sensors and Signals of Opportunity for Unassisted Navigation," in Proc. NAV08/ILA37: The Navigation Conference & Exhibition, London, UK, October 2008. [ANT]

**VETH, MICHAEL J., Lt Col, Department of Electrical and Computer Engineering**

**SPONSOR FUNDED RESEARCH PROJECTS**

"Next Generation Navigation Reference System." Sponsor: AFMC. Funding: \$89,030. [ANT]

**REFEREED JOURNAL PUBLICATIONS**

"A Comparison of Two Image and Inertial Sensor Fusion Techniques for Navigation in Unmapped Environments," Taylor, C.N., Veth, M.J., Raquet, J.F., Miller, M.M., *IEEE Transactions on Aerospace and Electronic Systems*. [ANT]

**REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW**

"LQG Control Design for a Hovering Micro Air Vehicle using an Optical Tracking System," Hendrix, C.D., Veth, M.J., Carr, R.W., *IEEE Aerospace Conference*, Big Sky, MT, 2009. [ANT]

"Image-Based Relative Navigation for the Autonomous Refueling Problem Using Predictive Rendering," Weaver, A.D., Veth, M.J., *IEEE Aerospace Conference*, Big Sky, MT, 2009. [ANT]

## 6.2. CENTER FOR DIRECTED ENERGY

### Center for Directed Energy [CDE]

Director 255-3636 x7294

Program Coordinator 255-3636 x4600

Homepage: <http://www.afit.edu/en/DE/>

### FACULTY RESEARCH OUTPUT

\*Faculty Bios can be found under their respective department listings.

#### BOHN, MATTHEW J., Lt Col, Department of Engineering Physics

##### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Fiorino, Steven T., Bartell, Richard J., Krizo, Matthew J., Marek, Seth L., Bohn, Matthew J., Randall, Robb M., and Cusumano, Salvatore J., "A Computational Tool for Evaluating THz Imaging Performance in Brownout Conditions at Land Sites throughout the World," *Proceedings of the SPIE, SPIE Defense and Security Symposium*, Vol. 7324, article no. 732410 (April 2009). [CDE]

#### CUSUMANO, SALVATORE J., Department of Engineering Physics

##### SPONSOR FUNDED RESEARCH PROJECTS

"FY09 HEL-JTO Model & Simulation TAWG Product Development." Sponsor: HEL-JTO. Funding: \$773,320. [CDE]

##### SPONSOR FUNDED EDUCATIONAL PROJECTS

"Laser Weapons System Short Course." Sponsor: MDA. Funding: \$18,100. [CDE]

##### REFEREED JOURNAL PUBLICATIONS

Fiorino, S.T. Bartell, R.J., Krizo, M.J., Perram, G.P., Fedyk, D.J., Moore, K.P., Harris, T.R., Cusumano, S.J., Richmond, R., and Gebhardt, M.J., "Worldwide assessments of laser radar tactical scenario performance variability for diverse low altitude atmospheric conditions at 1.0642  $\mu\text{m}$  and 1.557  $\mu\text{m}$ ," *Journal of Applied Remote Sensing*, Vol 3, article no. 03351 (March 2009). [CDE]

Fiorino, S.T., Bartell, R.J., Krizo, M.J., Perram, G.P., Fedyk, D.J., Moore, K.P., Harris, T. R., and Cusumano, S.J., "Worldwide Mission Planning Tool for Tactical High Energy Laser Systems Operating at Wavelengths Up to 14  $\mu\text{m}$ ," *American Institute of Aeronautics and Astronautics Journal of Aerospace Computing, Information, and Communication* (August 2009). [CDE]

##### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Fiorino, Steven T., Bartell, Richard J., Krizo, Matthew J., Marek, Seth L., Bohn, Matthew J., Randall, Robb M., and Cusumano, Salvatore J., "A Computational Tool for Evaluating THz Imaging Performance in Brownout Conditions at Land Sites throughout the World," *Proceedings of the SPIE, SPIE Defense and Security Symposium*, Vol. 7324, article no. 732410 (April 2009). [CDE]

**FIORINO, STEVEN T., Department of Engineering Physics**

SPONSOR FUNDED RESEARCH PROJECTS

"Support for Field Validation of AFIT CDE's Off-Axis Laser Irradiance Calculation Tool." Sponsor: HEL-JTO. Funding: \$50,000. [CDE]

SPONSOR FUNDED EDUCATIONAL PROJECTS

"2009 AFIT Center for Directed Energy Summer Intern Proposal." Sponsor: HEL-JTO. Funding: \$40,155. [CDE]

REFEREED JOURNAL PUBLICATIONS

Fiorino, S.T. Bartell, R.J., Krizo, M.J., Perram, G.P., Fedyk, D.J., Moore, K.P., Harris, T.R., Cusumano, S.J., Richmond, R., and Gebhardt, M.J., "Worldwide assessments of laser radar tactical scenario performance variability for diverse low altitude atmospheric conditions at 1.0642  $\mu\text{m}$  and 1.557  $\mu\text{m}$ ," *Journal of Applied Remote Sensing*, Vol 3, article no. 03351 (March 2009). [CDE]

Narcisse, D.L.C., Fiorino, S.T., Bartell, R.J., "Optimizing the Effectiveness of Directed Energy Weapons with Specialized Weather Support," *Air and Space Power Journal*. Vol XXIII, No. 2, pp. 57-66 (June 2009). [CDE]

Fiorino, S.T., Bartell, R.J., Krizo, M.J., Perram, G.P., Fedyk, D.J., Moore, K.P., Harris, T. R., and Cusumano, S.J., "Worldwide Mission Planning Tool for Tactical High Energy Laser Systems Operating at Wavelengths Up to 14  $\mu\text{m}$ ," *American Institute of Aeronautics and Astronautics Journal of Aerospace Computing, Information, and Communication* (August 2009). [CDE]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

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**GROSS, KEVIN C., Department of Engineering Physics**

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Gross K.C., Randall, R.M., Perram, G.P., "Atmospheric Correction Algorithm for Moderate-Resolution Infrared Spectral Measurements," Air & Waste Management Association's 102<sup>nd</sup> Annual Conference and Exhibition, Detroit, MI, June 2009. Paper 2009-A-473-AWMA, ISBN: 9781933474052. [CDE, CMSR]

**HAGER, GORDON, Department of Engineering Physics**

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**MAGNUS, AMY L., Maj, Department of Engineering Physics**

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**MARCINIAK, MICHAEL A., Department of Engineering Physics**

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OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Tatar, J.J., Cole, W.P. and Marciniak, M.A., "Wave Optics Simulation and Prediction of Retro-reflections from Optical Systems," 2008 Ohio Section of the American Physical Society Fall Meeting (C8.00003), 10-11 October 2008, Dayton, OH. [CDE]

Grice, P. and Marciniak, M.A., "Image-based BRDF acquisition," Directed Energy Professional Society 11<sup>th</sup> Annual Symposium, 17-21 November 2008, Honolulu, HI. [CDE]

Cole, W.P. and Marciniak, M.A., "Signatures of laser-illuminated devices," 2008 Advanced Signatures Technology Symposium, 18-20 November 2008, Charlottesville, VA. [CDE]

Hoelscher, M.G. and Marciniak, M.A., "Restoration of scene information reflected from non-specular media," Directed Energy Professional Society 4<sup>th</sup> Systems Symposium, 6-10 April 2009, Monterey, CA. [CDE]

**PERRAM, GLEN P., Department of Engineering Physics**

SPONSOR FUNDED RESEARCH PROJECTS

"AFOSR Center of Excellence in High Power Gas Phase Electric and Hybrid Laser Kinetics and Spectroscopy." Sponsor: AFOSR. Funding: \$59,471. [CDE]

"Center of Excellence for Gas Phase Hybrid Lasers: Additional Student Support." Sponsor: AFOSR. Funding: \$67,195. [CDE]

"High Power Diode Pumped Alkali Vapor Lasers and Analog Systems." Sponsor: HEL-JTO. Funding: \$352,450. [CDE]

"Measure High Priority Kinetic Rates for DPALS." Sponsor: AFRL/RD. Funding: \$30,000. [CDE]

"Thermal Control of Diode Pumped Alkali Lasers Using Heat Pipes." Sponsor: HEL-JTO. Funding: \$40,000. [CDE]

#### SPONSOR FUNDED EDUCATIONAL PROJECTS

"Technical and Administrative Support for the AFOSR Center of Excellence in High Power Gas Phase and Electric Lasers." Sponsor: AFRL/RD. Funding: \$85,000. [CDE]

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Wertepny, Douglas, Pitz, Greg, and Perram, Glen, "*Pressure broadening and shifting of the Cesium D1 and D2 lines by rare gases*" Ohio Sectional Meeting of the American Physical Society, 10-11 October 2008, Dayton, Ohio. [CDE]

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Rice, Chris and Perram, Glen P., "A Rugged TDLAS System for Open Path Monitoring," *Air and Waste Management Association 102<sup>nd</sup> Annual Conference*, 16-19 June 2009, Detroit, MI. [CDE]

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#### **RANDALL, ROBB M., Maj, Department of Engineering Physics**

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Gross K.C., Randall, R.M., Perram, G.P., "Atmospheric Correction Algorithm for Moderate-Resolution Infrared Spectral Measurements," *Air & Waste Management Association's 102<sup>nd</sup> Annual Conference and Exhibition*, Detroit, MI, June 2009. Paper 2009-A-473-AWMA, ISBN: 9781933474052. [CDE, CMSR]

**SCHMIDT, JASON D., Maj, Department of Electrical and Computer Engineering**

**SPONSOR FUNDED RESEARCH PROJECTS**

“Advanced Wavefront Estimation in Strong Turbulence.” Sponsor: AFOSR. Funding: \$97,256. [CDE]

“Advanced Wavefront Sensing and Control.” Sponsor: AFRL/RD. Funding: \$30,000. [CDE]

**REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW**

Ellis, T. R. and Schmidt, J. D., “Hybrid Wavefront Sensor for Strong Turbulence,” *OSA Frontiers in Optics*, FMF2, Rochester, NY, October 2008. [CDE]

Monz, A. B. and Schmidt, J. D., “A Maximum Likelihood Estimator for Tracking Purposes with Extended Sources,” *IEEE Aerospace Conference*, 1568, Big Sky, MT, March 2009. [CDE]

**REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW**

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Corej, T. A. and Schmidt, J. D., “Impact of Resolution in Multi-Conjugate Adaptive Optics Using Segmented Mirrors,” *Proc. SPIE*. Vol. 7466, 74660B, San Diego, CA, August 2009. [CDE]

Perez, J. J., Toussaint, G. J., and Schmidt, J. D., “Adaptive Control of Woofer-Tweeter Adaptive Optics,” *Proc. SPIE*. Vol. 7466, 74660B, San Diego, CA, August 2009. [CDE]

Engstrom, N. D. and Schmidt, J. D., “Misregistration in Adaptive Optics Systems,” *Proc. SPIE*. Vol. 7466, 74660A, San Diego, CA, August 2009. [CDE]

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Schmidt, J. D., Numerical Simulation of Optical Wave Propagation, SPIE Press, Bellingham, WA. [CDE]

**OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES**

Invited Talk: Schmidt, J. D. and Louthain, J. A. “Integrated Approach to Free-Space Optical Communication,” *Atmospheric Propagation of Electromagnetic Waves. Proc. SPIE*, Vol. 7200, 7200I, San Jose, CA, January 2009. [CDE]

### 6.3. CENTER FOR CYBERSPACE RESEARCH

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#### FACULTY RESEARCH OUTPUT

\*Faculty Bios can be found under their respective department listings.

#### BALDWIN, RUSTY O., Department of Electrical and Computer Engineering

##### SPONSOR FUNDED RESEARCH PROJECTS

"A Mathematical Framework for the Performance Evaluation of Large-Scale Sensor Networks." Sponsor: NSF. Funding: \$100,000. [CCR]

"Tactical SIGINT Technology Program (TST)." Sponsor: NSA. Funding: \$1,338,000. [CCR]

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C.J. Antosh, B.E. Mullins, R.O. Baldwin, and R.A. Raines, "A Comparison of Keying Methods in the Hubenko Architecture as Applied to Wireless Sensor Networks," *International Journal of Autonomous and Adaptive Communications Systems*, August 2009. [CCR]

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D.D. Hodson, R.O. Baldwin, D. Gehl, J. Weber, and S. Narayanan, "Real-Time Design Patterns in Virtual Simulations," *International Journal of Modeling and Simulation*, March 2009. [CCR]

D.W. Marsh, R.O. Baldwin, B.E. Mullins, R.F. Mills, and M.R. Grimaila, "A Security Policy Language for Wireless Sensor Networks," *Journal of Systems and Software*, Vol. 82, No. 1, pp. 101-111, January 2009. [CCR]

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- D.J. Kelly, R.A. Raines, M.R. Grimaila, R.O. Baldwin, and B.E. Mullins, "Towards a Tree-based Taxonomy of Anonymous Networks," *2009 Consumer Communications and Networking Conference*, (CCNC 2009), Las Vegas NV, January 2009, pp. 1-2. [CCR]
- D.J. Kelly, R.A. Raines, M.R. Grimaila, R.O. Baldwin, and B.E. Mullins, "Towards Mathematically Modeling the Anonymity Reasoning Ability of an Adversary," *27th IEEE International Performance Computing and Communications Conference*, (IPCCC 2008), Austin TX, December 2008, pp. 524-531. [CCR]
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- D.J. Kelly, R.A. Raines, M.R. Grimaila, R.O. Baldwin, and B.E. Mullins, "A Survey of State-of-the-Art in Anonymity Metrics," *1st ACM Network Data Anonymization (NDA) Workshop* (NDA 2008), Alexandria VA, October 2008, pp. 31-40. [CCR]

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- D.D. Hodson, R.O. Baldwin, T. Menke, "Design Patterns that Efficiently Incorporate Real-Time Concepts with Object-Oriented Software Paradigms on Multi-CPU Computers to Support LVC Simulation Construction," *2009 International Test and Evaluation Association Live Virtual Constructive Conference*, El Paso TX, January 2009, pp. HPC.8.1-HPC.8.6. [CCR]
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- D.W. Marsh, R.O. Baldwin, and B.E. Mullins, "Chapter 11: Wireless Sensor Network Authorization Specification Language: The Formal Models," *Computer and Network Security, Volume 3: Security in Ad-hoc and Sensor Networks*, World Scientific Press, July 2009, pp. 333-368. [CCR]

#### **GRMAILA, MICHAEL R., Department of Systems Engineering and Management**

##### SPONSOR FUNDED RESEARCH PROJECTS

- "Foundational Research for the Development of a Cyber Incident Mission Impact Assessment (CIMIA) Process." Sponsor: 711 HPW/RH. Funding: \$280,000. [CCR]
- "Insider Threat Detection Using Web Server Log Files." Sponsor: NSA. Funding: \$10,000. [CCR]

#### **HUMPHRIES, JEFFREY W., Lt Col, Department of Electrical and Computer Engineering**

##### SPONSOR FUNDED RESEARCH PROJECTS

- "Base Critical Infrastructure Protection (CIP) Research." Sponsor: AFRL/RX. Funding \$98,000. [CCR]

**LAMONT, GARY B., Department of Electrical and Computer Engineering**

**SPONSOR FUNDED RESEARCH PROJECTS**

"Self Organized Multi-Agent Swarms for Network Security Control." Sponsor: AFRL/RV. Funding: \$80,000. [CCR]

**McDONALD, J. TODD, Lt Col, Department of Electrical and Computer Engineering**

**SPONSOR FUNDED RESEARCH PROJECTS**

"Architectural Framework for Evaluating General, Efficient, and Measurable Program Protection." Sponsor: AFOSR. Funding: \$27,683. [CCR]

**MILLS, ROBERT F., Department of Electrical and Computer Engineering**

**SPONSOR FUNDED RESEARCH PROJECTS**

"Cyberspace Situational Awareness." Sponsor: 711 HPW/RH. Funding: \$40,000. [CCR]

"Insider Threat Detection Using Information System and Infrastructure Log Files." Sponsor: NSA. Funding: \$34,574. [CCR]

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Marsh, D.W., Baldwin, R.O., Mullins, B.E., Mills, R.F., and Grimaila, M.R., "A Security Policy Language for Wireless Sensor Networks," Journal of Systems and Software, January 2009, Vol. 82, No. 1, pp. 101-111. [CCR]

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Suski, W.C., Temple, M.A., Mendenhall, M.J., and Mills, R.F., "Using Spectral Fingerprints to Improve Wireless Network Security," 2008 IEEE Global Communication Conference (GLOBECOMM 08), Computer and Communications Security Symposium. [CCR]

Kaun, M.D., Temple, M.A., Mills, R.F., and Mendenhall, M.J., "Exploiting the Electromagnetic Environment (EME) Using Entropy-Based Time-Frequency Techniques," 2008 Military Communications Conference (MILCOM-2008), Classified Session. [CCR]

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Schrader, K., Mullins, B., Peterson, G. and Mills, R., "Tracking Contraband Files Transmitted Using Bit-torrent," *Advances in Digital Forensics V*, S. Sheno and G. Peterson, Eds., New York, NY: Springer Science+Business Media, 2009, pp. 159-174. [CCR]

Mills, R.F., Peterson, G.L., and Grimaila, M.R., "Insider Threat Prevention, Detection, and Mitigation," *Cyber-Security and Global Information Assurance: Threat Analysis and Response Solutions*, K. Knapp, ed., IGI Global Publishing, March 2009, pp. 48-74 [CCR]

## **MULLINS, BARRY E., Department of Electrical and Computer Engineering**

### SPONSOR FUNDED RESEARCH PROJECTS

"Air Force Communication Systems Modeling." Sponsor: Air Force Communications Agency. Funding: \$17,000. [CCR]

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Karrels, D. R., Peterson, G. L., and Mullins, B. E., "Structured P2P Systems for Distributed Command and Control," *Peer-to-Peer Networking and Applications*, 7 March 2009, DOI 10.1007/s12083-009-0033-y, pp. 1-23. [CCR]

Mullins, B. E., Seyba, J. R., Raines, R. A., Ramsey, B. W., and Williams, P. D., "Voice and Video Capacity of a Secure IEEE 802.11g Wireless Network," *Mobile Computing and Communications Review*, Vol. 13, No. 1, January 2009, pp. 26-34. [CCR]

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Phillips, A. N., Mullins, B. E., Raines, R. A., and Baldwin, R. O., "A Secure Group Communication Architecture for Autonomous Unmanned Aerial Vehicles," *Security and Communication Networks*, DOI: 10.1002/sec.55, October 2008, pp. 55-69. [CCR]

Mann, C. R., Baldwin, R. O., Kharoufeh, J. P., and Mullins, B. E., "A Queueing Approach to Optimal Resource Replication in Wireless Sensor Networks," *Performance Evaluation*, Vol. 65, No. 10, October 2008, pp. 689-700. [CCR]

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Kelly, D. J., Raines, R. A., Baldwin, R. O., Mullins, B. E., and Grimaila, M. R., "Towards a Taxonomy of Wired and Wireless Anonymous Networks," *IEEE International Communications Conference 2009*, Dresden Germany, June 2009, pp. 1-8. [CCR]

Santos, L. N. P., Mullins, B. E., Baldwin, R. O., and Thomas, R. W., "VoIP over MANETS: A Performance Analysis of OLSR," *4<sup>th</sup> International Conference on Information Warfare and Security (ICIW 2009)*, Breakwater Lodge, Cape Town, South Africa, 26-27 March 2009, pp. 90-100. [CCR]

Wabiszewski, M. G., Andel, T. R., Mullins, B. E., and Thomas, R. W., "Enhancing Realistic Hands-On Network Training in a Virtual Environment," *Military Modeling and Simulation Symposium (MMS'09)*, San Diego CA, 22-27 March 2009, pp. 1-8. [CCR]

- Lidowski, R. L., Mullins, B. E., and Baldwin, R. O., "A Novel Communications Protocol Using Geographic Routing for Swarming UAVs Performing a Search Mission," *Seventh IEEE International Conference on Pervasive Computing and Communications*, Galveston, TX, 9-13 March 2009, pp. 162-168. [CCR]
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- Ramsey, B. W., Mullins, B. E., Thomas, R. W., and Andel, T. R., "Subjective Audio Quality over Secure IEEE 802.11 Wireless Local Area Networks," *1<sup>st</sup> IEEE International Workshop on Network Security and Privacy in conjunction with the IEEE IPCCC 2008 (27<sup>th</sup> IEEE International Performance Computing and Communications Conference)*, Austin TX, 7-9 December 2008, pp. 469-474. [CCR]
- Antosh, C. J., and Mullins, B. E., "The Scalability of Secure Lock," *1<sup>st</sup> IEEE International Workshop on Information and Data Assurance in conjunction with the IEEE IPCCC 2008 (27<sup>th</sup> IEEE International Performance Computing and Communications Conference)*, Austin TX, 7-9 December 2008, pp. 507-512, Best Paper Award. [CCR]
- Hopp, S. J., Temple, M. A., Mullins, B. E., and Baldwin, R. O., "Coexistent Performance Characterization of a Simulated GMSK System Using Operational Parameters," *IEEE Military Communications Conference (MILCOM 2008)*, San Diego CA, November 2008, pp. 1-5. [CCR]
- Kelly, D. J., Raines, R. A., Grimaila, M. R., Baldwin, R. O., and Mullins, B. E., "A Survey of State-of-the-Art in Anonymous Metrics," *First ACM Workshop on Network Data Anonymization (NDA 2008)*, Alexandria VA, 31 October 2008, pp. 1-9. [CCR]

#### BOOKS AND CHAPTERS IN BOOKS

- Schrader, K. R., Mullins, B. E., Peterson, G. L., and Mills, R. F., "A Digital Forensic Tool for Detecting and Tracking Contraband Digital Files Transmitted Via the BitTorrent Peer-to-Peer Protocol," *Advances in Digital Forensics V*, S. Sheno, and P. Craiger, eds., Springer Science+Business Media, New York, NY, 2009, pp. 159-174. [CCR]
- Marsh, D. W., Baldwin, R. O., and Mullins, B. E., "Wireless Sensor Network Authorization Specification Language: A Formal Model," *Security in Ad-hoc and Sensor Networks*, World Scientific Press, July 2009, pp. 333-368. [CCR]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

- Pagel, B. A., and Mullins, B. E., "Virtualization: The Supermax Prison for Your Computer," Air University Blue Dart, March 2009. [CCR]
- Santos, L. N. P., and Mullins, B. E., "Using Mobile Ad Hoc Networks for Communications," Air University Blue Dart, March 2009. [CCR]
- Antosh, C. J., and Mullins, B. E., "AFIT Research Supports Replacement of Landmines," Air University Blue Dart, March 2009. [CCR]
- Schrader, K. R., and Mullins, B. E., "TRAPPING Contraband File Sharers on Government Networks," Air University Blue Dart, February 2009. [CCR]



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Schrader, K. R., Mullins, B. E., Peterson, G. L., and Mills, R. F., "TRAPP: A Forensic Tool for Detecting and Tracking Contraband Digital Information Transmitted Via Peer-to-Peer Protocols," presented at the *Fourth Annual Dayton Engineering Sciences Symposium*, Wright State University, Dayton OH, 27 October 2008. Best Presentation in Computer Sciences. [CCR]

Ramsey, B. W., Mullins, B. E., Thomas, R. W., and Andel, T. R., "Subjective Audio Quality over Secure IEEE 802.11 Wireless Local Area Networks," presented at the *Fourth Annual Dayton Engineering Sciences Symposium*, Wright State University, Dayton OH, 27 October 2008. [CCR]

Santos, L. N. P., Mullins, B. E., Baldwin, R. O., and Thomas, R. W., "VoIP over MANETS: A Performance Analysis of OLSR," presented at the *Fourth Annual Dayton Engineering Sciences Symposium*, Wright State University, Dayton OH, 27 October 2008. [CCR]

### **OXLEY, MARK E., Department of Mathematics and Statistics**

#### **SPONSOR FUNDED RESEARCH PROJECTS**

"Qualia Exploitation of Sensor Technology for Structural Health Management." Sponsor: AFRL/RB. Funding: \$45,000. [CCR]

### **PETERSON, GILBERT L., Department of Electrical and Computer Engineering**

#### **SPONSOR FUNDED RESEARCH PROJECTS**

"CyberCraft Environment Modeling for C3." Sponsor: AFRL/RI. Funding: \$221,130. [CCR]

#### **REFEREED JOURNAL PUBLICATIONS**

Karrels, D., Peterson, G.L., and Mullins, B.E., "Structured P2P Technologies for Distributed Command and Control," *Peer-to-Peer Networking and Applications*, vol. 2, no. 4, pp. 311-333, 2009. [CCR]

Stevens, M., Williams, P.D., Peterson, G.L., and Kurkowski, S.H., "Integrating Trust into the CyberCraft Initiative via the Trust Vectors Model," *IEEE Computational Intelligence Magazine*, vol. 3, no. 2, pp. 65-68, 2008. [CCR]

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Karrels, D.R., Peterson, G.L., and Mullins, B.E., "RC-Chord: Resource Clustering in a Large-Scale Hierarchical Peer-to-Peer System," *MILCOM 2009*, pp. 860-864, 2009. [CCR]

Seymour, R.S., and Peterson, G.L., "A Trust-based Multiagent System," *2009 IEEE International Conference on Privacy, Security, Risk and Trust (PASSAT-09)*, September 2009, pp. 109-116. [CCR]

Okolica, J.S., McDonald, J.T., Peterson, G.L., Mills, R.F., and Haas, M.W., "Developing Systems for Cyber Situational Awareness," *Proceedings of the 2nd Cyberspace Research Workshop*, July 2009, pp. 46-56. [CCR]

#### **BOOKS AND CHAPTERS IN BOOKS**

Shenoi, S., and Peterson, G.L., *Advances in Digital Forensics V*, New York, NY: Springer Science+Business Media, 2009. [CCR]

- Schrader, K.F., Mullins, B.E., Peterson, G.L., and Mills, R.F., "Tracking Contraband Files Transmitted Using BitTorrent," *Advances in Digital Forensics V*, S. Shenoi and G. Peterson, Eds., New York, NY: Springer Science+Business Media, 2009, pp. 159-174. [CCR]
- Holloway, E.M., Lamont, G.B., and Peterson, G.L., "Military Network Security Using Self Organized Multi-Agent Swarms," *IEEE Symposium on Computational Intelligence in Cyber Security*, pp. 2559-2566, 2009. [CCR]
- Lacey, T., Peterson, G.L., and Mills, R.F., "The Enhancement of Graduate Digital Forensics Education via the DC3 Digital Forensics Challenge," *Hawaii International Conference on System Sciences (HICSS)*, Big Island, HI, January 2009, pp. 1-9. [CCR]
- Millar, J.R., Peterson, G.L., and Mendenhall, M.J., "Document Clustering and Visualization with Latent Dirichlet Allocation and Self-Organizing Maps," *The 22<sup>nd</sup> International FLAIRS Conference*, Sanibel Island, FL, May 2009, pp. 69-74. [CCR]
- Seymour, R.S., and Peterson, G.L., "Responding to Sneaky Agents in Multi-agent Domains," *The 22<sup>nd</sup> International FLAIRS Conference*, Sanibel Island, FL, May 2009, pp. 99-104. [CCR]

## **RAINES, RICHARD A., Department of Electrical and Computer Engineering**

### SPONSOR FUNDED EDUCATIONAL PROJECTS

"IASP Tuition and Resource Support for the AFIT Center for Cyberspace Research." Sponsor: NSA.  
Funding: \$373,647. [CCR]

### REFEREED JOURNAL PUBLICATIONS

- B. D. Birrer, R. A. Raines, R. O. Baldwin, M. Oxley, and S. K. Rogers, "Using Qualia and Multi-Layered Relationships in Malware Detection," *Journal of Information Assurance and Security (JIAS)*, 2009, Vol. 4, No. 3, pp. 247-255. [CCR]
- B. E. Mullins, J. R. Seyba, R. A. Raines, B. W. Ramsey and P. D. Williams, "Voice and Video Capacity of a Secure IEEE 802.11g Wireless Network," *Mobile Computing and Communications Review*, 2008, Vol. 13, No. 1, pp. 26-34. [CCR]
- A. N. Phillips, B. E. Mullins, R. A. Raines, and R. O. Baldwin, "A Secure Group Communication Architecture for Autonomous Unmanned Aerial Vehicles," *Security and Communication Networks*, 2008, DOI: 10.1002/sec. 55, pp. 1-15. [CCR]

### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

- S. Cooper, C. Nickell, V. Piotrowski, B. Oldfield, A. Abdallah, M. Bishop, B. Caelli, M. Dark, E. K. Hawthorne, L. Hoffman, L. Perez, C. Pfleeger, R. Raines, and C. Schou, "Information Assurance Education Guidelines and Standards," *Proceedings of the 2009 ACM SIGCSE Annual Conference on Innovation & Technology in Computer Science Education*, Paris France, July 2009. [CCR]
- D. J. Kelly, R. A. Raines, R. O. Baldwin, B. E. Mullins, and M. R. Grimaila, "Towards a Taxonomy of Wired and Wireless Anonymous Networks," *IEEE International Communications Conference 2009*, Dresden Germany, 14-18 June 2009, 35% acceptance rate. [CCR]
- B. D. Birrer, R. A. Raines, R. O. Baldwin, M. Oxley, and S. K. Rogers, "Using Qualia and Multi-Layered Relationships in Malware Detection," *2009 IEEE Symposium on Computational Intelligence in Cyber Security (CICS 2009)*, Nashville, TN, March 2009, pp. 1-6. [CCR]

D. J. Kelly, R. A. Raines, R. O. Baldwin, B. E. Mullins, and M. R. Grimaila, "Towards a Tree-based Taxonomy of Anonymous Networks," *IEEE Consumer Communications & Networking Conference*, Las Vegas NV, 14 January 2009, pp. 1-2. [CCR]

D. J. Kelly, R. A. Raines, R. O. Baldwin, B. E. Mullins, and M. R. Grimaila, "Towards Mathematically Modeling the Anonymity Reasoning Ability of an Adversary," *27<sup>th</sup> IEEE International Performance Computing and Communications Conference/Workshop on Information and Data Assurance*, Austin TX, December 2008, pp. 524-531. [CCR]

D. J. Kelly, R. A. Raines, R. O. Baldwin, B. E. Mullins, and M. R. Grimaila, "A Survey of State-of-the-Art in Anonymity Metrics," *First ACM Workshop on Network Data Anonymization (NDA 2008)* in association with the *Fifteenth ACM Conference on Computer and Communications Security*, Alexandria VA, October 2008, pp. 1-5 (CD). [CCR]

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

B. D. Birrer, R. A. Raines, R. O. Baldwin, M. Oxley, and S. K. Rogers, "Using Qualia and Novel Representations in Malware Detection," *2009 SPIE Defense Security and Sensing Conference*, Orlando FL, 13-17 April 2009, pp. 1-6. [CCR]

**TEMPLE, MICHAEL A., Department of Electrical and Computer Engineering**

#### SPONSOR FUNDED RESEARCH PROJECTS

"Technical Support: Opportunistic Channel Assessment." Sponsor: Laboratory for Telecommunications Sciences. Funding: \$50,000. [CCR]

## 6.4. CENTER FOR MASINT STUDIES AND RESEARCH

### Center for MASINT Studies and Research [CMSR]

Director 255-3636 x4536  
Executive Program Coordinator 255-7287  
FAX 656-6000  
Homepage: <http://www.afit.edu/cmsr/>

### FACULTY RESEARCH OUTPUT

\*Faculty Bios can be found under their respective department listings.

#### BUNKER, DAVID J., Department of Engineering Physics

##### SPONSOR FUNDED RESEARCH PROJECTS

"ONIR Ground Truth Support." Sponsor: NASIC. Funding: \$289,441. [CMSR]

#### GROSS, KEVIN C., Department of Engineering Physics

##### SPONSOR FUNDED RESEARCH PROJECTS

"Classifying Transient Event Signatures Using a Spectro-Kinetic Model." Sponsor: AS&T. Funding: \$147,102. [CMSR]

"ONIR Ground Truth Support." Sponsor: NASIC. Funding: \$289,441. [CMSR]

##### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Gross K.C., Randall, R.M., Perram, G.P., "Atmospheric Correction Algorithm for Moderate-Resolution Infrared Spectral Measurements," Air & Waste Management Association's 102<sup>nd</sup> Annual Conference and Exhibition, Detroit, MI, June 2009. Paper 2009-A-473-AWMA, ISBN: 9781933474052. [CDE, CMSR]

Bradley K.C., Gross, K.C.; Perram, G.P., "Imaging Fourier Transform Spectrometry of Industrial Smokestack Effluents." Air & Waste Management Association's 102<sup>nd</sup> Annual Conference and Exhibition, Detroit, MI, June 2009. Paper 2009-A-85-AWMA, ISBN: 9781933474052. [CMSR]

Bradley, K.C., Bowen, S.J. Gross, K.C., Marciniak, M.A., Perram, G.P., "Imaging Fourier Transform Spectrometry of Jet Engine Exhaust with the Telops FIRST-MWE," Aerospace Conference, 2009 IEEE, pp. 1-8 (2009), DOI://10.1109/AERO.2009.4839444. Big Sky MT, March 2009. [CMSR]

##### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Gross, K.C., Gordon, J.M., Perram, G.P., "Temporally resolved infrared spectra from the detonation of advanced munitions," Proceedings of SPIE, Vol. 7330, 733006, Orlando FL, April 2009. [CMSR]

Bradley, K.C., Gross, K.C., Perram, G.P., "Imaging Fourier transform spectrometry of chemical plumes," Proceedings of SPIE, Vol. 7304, 73040J, Orlando FL, April 2009. [CMSR]

Gross, K.C., Moore, E.A., Bowen, S.J. Chamberland, M., Farley, V., Gagnon, J.-P., Lagueux, P., "Characterizing and overcoming spectral artifacts in imaging Fourier-transform spectroscopy of turbulent exhaust plumes," Proceedings of SPIE, Vol. 7304, 730416, Orlando FL, April 2009. [CMSR]

#### BOOKS AND CHAPTERS IN BOOKS

Gross K. C., Perram G. P., "The Phenomenology of High Explosive Fireballs from Fielded Spectroscopic and Imaging Sensors for Event Classification" in *Selected Topics in Electronics and Systems – Vol 48*. World Scientific Publishing, Hackensack, NJ, pp. 277-288, 2009, ISBN-13: 978-981-283-323-5. [CMSR]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Schott, B., Gross, K.C., Perram, G.P., "Infrared spectra of detonation fireballs," Ohio Sectional Meeting of the American Physical Society, 10-11 October 2008, Dayton, OH. [CMSR]

Bowen, S., Bradley, K.C., Gross, K.C., Perram, G.P. and Marciniak, M.A., "Hyperspectral imaging of aircraft exhaust plumes," Ohio Section of the American Physical Society, 10-11 October 2008, Dayton, OH. [CMSR]

Slagle, S.E., Perram, G.P., Gross, K.C., "Advanced radiometry for detonation fireball characterization," 4<sup>th</sup> Annual Advanced Signatures and Technology Symposium, National Ground Intelligence Center, Charlottesville, VA, 18 November 2008. [CMSR]

Gross, K.C., Slagle, S.E., Perram, G.P., "Advanced Radiometry for Characterization of Transient Combustion Events," 15th NASIC Spectral Analyst Exchange Forum, NASIC, Wright-Patterson AFB OH, 28 May 2009. [CMSR]

Gross, K.C., Perram, G.P., "Remote Sensing in support of the Counter-IED Problem," JIEDDO Signatures IPT, Washington D.C., 23 September 2009. [CMSR]

#### **HAWKS, MICHAEL R., Lt Col, Department of Engineering Physics**

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Hawks, Michael R. and Perram, Glen P., "Use of Band Models to Describe Absorption over Inhomogeneous Paths," 31<sup>st</sup> *Atmospheric Transmission Models Meeting*, 16-17 June 2009, Lexington, MA. [CMSR]

#### **MARCINIAK, MICHAEL A., Department of Engineering Physics**

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Bradley, Kenneth L., Bowen, Spencer, Gross, Kevin C., Marciniak, Michael A., and Perram, Glen P., "Imaging Fourier Transform Spectrometry of Jet Engine Exhaust with the Telops FIRST-MWE," *IEEE Aerospace Conference*, Paper 5.0502, pp. 1-8, March 7-14, 2009, Big Sky, Montana. [CMSR]

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Bowen, S., Marciniak, M.A., Bradley, K.C., Perram, G.P. and Gross, K.C., "Hyperspectral imaging of a turbine engine exhaust plume to determine radiance, temperature and concentration spatial distributions," *Proceedings of the 2009 Meeting of the Military Sensing Symposia (MSS) Specialty Group on Electro-Optical & Infrared Countermeasures (IRCM)*, Vol. 1, article no. IE05, Las Vegas, NV, April 2009. [CMSR]

## OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Bowen, S., Bradley, K.C., Gross, K.C., Perram, G.P. and Marciniak, M.A., "Hyper-spectral imaging of aircraft exhaust plumes," 2008 Ohio Section of the American Physical Society Fall Meeting (C5.00003), 10-11 October 2008, Dayton, OH. [CMSR]

## **PERRAM, GLEN P., Department of Engineering Physics**

## REFEREED JOURNAL PUBLICATIONS

Bostick, Randall L. and Perram, Glen P., "Hyperspectral Imaging using Chromotomography: A Fieldable Visible Instrument for Transient Events," *International Journal of High Speed Electronics and Systems (IJHSES)*, vol. 18, pp. 519-529 (December 2008). [CMSR]

## REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Bradley, Kenneth L., Bowen, Spencer, Gross, Kevin C., Marciniak, Michael A., and Perram, Glen P., "Imaging Fourier Transform Spectrometry of Jet Engine Exhaust with the Telops FIRST-MWE," *IEEE Aerospace Conference*, Paper 5.0502, pp. 1-8, March 7-14, 2009, Big Sky, Montana. [CMSR]

## REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Bowen, S., Marciniak, M.A., Bradley, K.C., Perram, G.P. and Gross, K.C., "Hyperspectral imaging of a turbine engine exhaust plume to determine radiance, temperature and concentration spatial distributions," *Proceedings of the 2009 Meeting of the Military Sensing Symposia (MSS) Specialty Group on Electro-Optical & Infrared Countermeasures (IRCM)*, Vol. 1, paper no. IE05, Las Vegas, NV, April 2009. [CMSR]

Gross, Kevin C., Perram, Glen P., Tremblay, Pierre, and Farley, Vincent, "Understanding and Overcoming Scene Change Artifacts in Imaging Fourier Transform Spectroscopy of a Turbulent Jet Engine," *Optical Engineering and Applications, Proceedings of the SPIE*, vol 7457, paper no. 74570F, 2-6 August 2009, San Diego, CA. [CMSR]

Chamberland, Martin, Farley, Vincent, Gagnon, Jean-Philippe, Lagueux, Philippe and Villemaire, André, Gross, Kevin C., and Perram, Glen P., "Characterizing and overcoming spectral artifacts in imaging Fourier-transform spectroscopy of turbulent exhaust plumes," *SPIE Defense and Security Symposium*, 13-17 April 2009, Orlando, FL, *Proceedings of the SPIE*, Vol. 7304, paper no. 730416 (May 2009). [CMSR]

Bostick, Randall L., Gross, Kevin C. and Perram, Glen P., "Design and Characterization of a Hyperspectral Chromotomographic Imaging System for Battlespace Defense," *SPIE Defense and Security Symposium*, 13-17 April 2009, Orlando, FL, *Proceedings of the SPIE*, Vol. 7319, paper no. 731903, May 2009. [CMSR]

Moore, Elizabeth A., Gross, Kevin C., Bowen, Spencer J., Perram, Glen P., Chamberland, Martin, Farley, Vincent, Gagnon, Jean-Philippe, and Lagueux, Philippe, "Characterizing and Overcoming Spectral Artifacts in Imaging Fourier-Transform Spectroscopy of Turbulent Exhaust Plumes," *SPIE Defense and Security Symposium*, 13-17 April 2009, Orlando, FL, *Proceedings of the SPIE*, vol 7304, paper no. 730416, May 2009. [CMSR]

Gordon, Joe, Gross, Kevin, and Perram, Glen, "Temporally-resolved, infrared spectra from the detonation of advanced munitions," *SPIE Defense and Security Symposium*, 13-17 April 2009, Orlando, FL, Proc. SPIE, Vol. 7330, paper no. 733006 (May 2009). [CMSR]

Bradley, Kenneth C., Gross, Kevin C., and Perram, Glen P., "Imaging Fourier Transform Spectrometry (IFTS) of Chemical Plumes," *SPIE Defense and Security Symposium*, 13-17 April 2009, Orlando, FL, Proc. SPIE, Vol. 7304, 73040J (May 2009). [CMSR]

## BOOKS AND CHAPTERS IN BOOKS

Gross K. C. and Perram G. P., "The Phenomenology Of High Explosive Fireballs from Fielded Spectroscopic And Imaging Sensors for Event Classification" in *Selected Topics in Electronics and Systems – Vol 48*. World Scientific Publishing, Hackensack, NJ, pp. 277-288, 2009, ISBN-13: 978-981-283-323-5. [CMSR]

## OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Hawks, Michael R. and Perram, Glen P., "Use of Band Models to Describe Absorption over Inhomogeneous Paths," *31<sup>st</sup> Atmospheric Transmission Models Meeting*, 16-17 June 2009, Lexington, MA. [CMSR]

Slagle, Steven E., Perram, Glen P., Gross, Kevin C., "Advanced radiometry for detonation fireball characterization," *4th Annual Advanced Signatures Technology Symposium*, November 2008. [CMSR]

Schott, Benjamin, Gross, Kevin, and Perram, Glen, "Infrared spectra of the detonation fireballs" Ohio Sectional Meeting of the American Physical Society, 10-11 October 2008, Dayton, Ohio. [CMSR]

Bowen, S., Bradley, K.C., Gross, K.C., Perram, G.P. and Marciniak, M.A., "Hyper-spectral imaging of aircraft exhaust plumes," 2008 Ohio Section of the American Physical Society Fall Meeting (C5.00003), 10-11 October 2008, Dayton, OH. [CMSR]

West, Leanne, Gimmestad, Gary, Herkert, Ralph, Smith, Bill, Kireev, Stanislav, Daniels, Taumi, Cornman, Larry, Sharman, Bob, Weekley, Andrew, Perram, Glen, Gross, Kevin, Smith, Greg, Feltz, Wayne, Taylor, Joe, and Olson, Erik, "Hazard Detection Analysis for a Forward-Looking Interferometer," *1st AIAA Atmospheric and Space Environment Conference*, 20-25 June 2009, San Antonio, TX. [CMSR]

Bradley, Kenneth C., Gross, Kevin C., and Perram, Glen P., "Imaging Fourier Transform Spectrometry of Industrial Smokestack Effluents," *Air and Waste Management Association 102<sup>nd</sup> Annual Conference*, 16-19 June 2009, Detroit, MI. [CMSR]

Randall, Robb M., Gross, Kevin, and Perram, Glen, "Characterize Atmospheric Infrared Active Trace Gases from Infrared Exothermic and Effluent Materials stand-off Detection Event Signatures," *Air and Waste Management Association 102<sup>nd</sup> Annual Conference*, 16-19 June 2009, Detroit, MI. [CDE, CMSR]

## **RANDALL, ROBB M., Maj, Department of Engineering Physics**

### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Gross K.C., Randall, R.M., Perram, G.P., "Atmospheric Correction Algorithm for Moderate-Resolution Infrared Spectral Measurements," *Air & Waste Management Association's 102<sup>nd</sup> Annual Conference and Exhibition*, Detroit, MI, June 2009. Paper 2009-A-473-AWMA, ISBN: 9781933474052. [CDE, CMSR]

## **TUTTLE, RONALD F., Department of Engineering Physics**

### SPONSOR FUNDED RESEARCH PROJECTS

"Advanced Sensor Integration Study." Sponsor: OSD. Funding: \$50,000. [CMSR]

"Advanced Technical Intelligence Research Support." Sponsor: NASIC. Funding: \$115,000. [CMSR]

"Chief Technology Office (CMSR)." Sponsor: SAF. Funding: \$328,745. [CMSR]

"Counterspace Research and Academic Support." Sponsor: NASIC. Funding: \$200,000. [CMSR]

"Development of Computer Assisted and Computer Automated Image Analysis Tools for Wide Area Persistent Surveillance for Military Operations." Sponsor: Leonard Wood Institute. Funding: \$95,000. [CMSR]

"Project Lake Effect- Phase 1." Sponsor: NASIC. Funding: \$230,000. [CMSR]

"Project Seven- Phase 1." Sponsor: DoD HQ. Funding: \$50,000. [CMSR]



## 6.5. CENTER FOR OPERATIONAL ANALYSIS

### Center for Operational Analysis (COA)

Director 255-6565 x4538

Projects Director 255-6565 x4251

Homepage: <http://www.afit.edu/coa/>

### FACULTY RESEARCH OUTPUT

\*Faculty Bios can be found under their respective department listings.

#### ANDERSON, BRADLEY E., Lt Col, Department of Operational Sciences

##### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Pursuing Waste Vegetable Oil as an Alternative Fuel, Harvey Gaber, Bradley Anderson, Production and Operations Management Society (POMS) Annual Conference, Orlando, FL, May 1-4, 2009. [COA]

#### BAUER, KENNETH W., Department of Operational Sciences

##### SPONSOR FUNDED RESEARCH PROJECTS

"Advanced Research in Automatic Target Recognition." Sponsor: NASIC. Funding: \$119,170. [COA]

"AFIT Analysis Support to JIEDDO, Task 1b." Sponsor: JIEDDO. Funding: \$129,186. [COA]

"Hyperspectral Target Detection." Sponsor: AS&T. Funding: \$74,298. [COA]

"Sensor Fusion for Automatic Target Recognition." Sponsor: AFRL/RV. Funding: \$50,000. [COA]

##### REFEREED JOURNAL PUBLICATIONS

Loeffelholz, Bernard; Bednar, Earl; and Bauer, Kenneth W. "Predicting NBA Games Using Neural Networks," Journal of Quantitative Analysis in Sports, Vol. 5, Issue 1, Article 7, 2009. [COA]

Smetek, T.E., K.W. Bauer, "A Comparison of Multivariate Outlier Detection Methods for Finding Hyperspectral Anomalies," Military Operations Research, Volume 13, No. 4, 2008, pp. 19-44. [COA]

##### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Christine M. Schubert, Mark E. Oxley, and Kenneth W. Bauer, Jr., "Bounds on the ROC Curves from Fused Correlated ATR Systems," Proceedings of SPIE, Signal Processing, Sensor Fusion, and Target Recognition XVIII, Editor: Ivan Kadar, Vol. 7336, paper 21, Orlando FL, 14-16 April 2009. [COA]

Steven N. Thorsen, Seth A. Wagenman, Mark E. Oxley, and Kenneth W. Bauer, "A Risk-Based Comparison of Classification Systems," Proceedings of SPIE, Signal Processing, Sensor Fusion, and Target Recognition XVIII, Editor: Ivan Kadar, Vol. 7336, paper 31, Orlando FL, 14-16 April 2009. [COA]

Ryer, David M. and Kenneth W. Bauer, "Enhanced Hyperspectral Face Recognition," Intelligent Engineering Systems through Artificial Neural Networks Volume 19: Computational Intelligence in Architecting Complex Engineering Systems, ASME Press, New York, 2009. [COA]

**CHAMBAL, STEPHEN P., Lt Col, Department of Operational Sciences**

SPONSOR FUNDED RESEARCH PROJECTS

"AFIT/ENS Support to the Air Force Technical Applications Center." Sponsor: AFTAC. Funding: \$75,000. [COA]

"COA Support." Sponsor: 711 HPW/RH. Funding: \$20,000. [COA]

"Research, Analysis, and Transition Support to the Air Force Global Logistics Support Center." Sponsor: AFGLSC. Funding: \$90,272. [COA]

SPONSOR FUNDED EDUCATIONAL PROJECTS

"Test and Evaluation Program Sponsorship." Sponsor: 746 TS. Funding: \$20,000. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

A Framework for Improving Experimental Designs and Statistical Models for T&E Hill, Chambal, AF T&E Days, Feb 2009. [COA]

Center for Operational Analysis and TECP Hill, Chambal, AF/TE Annual Conference, Jan 2009. [COA]

**CHRISSIS, JAMES W., Department of Operational Sciences**

REFEREED JOURNAL PUBLICATIONS

Mark A. Abramson, Charles Audet, James W. Chrissis, Jennifer Walston, "Mesh Adaptive Direct Search Algorithms for Mixed Variable Optimization," Optimization Letters, Vol. 3, No. 1, pp. 35-47, January 2009. [COA]

Todd A. Sriver, James W. Chrissis, Mark A. Abramson, "Pattern Search Ranking and Selection Algorithms for Mixed Variable Simulation-Based Optimization," European Journal of Operational Research, Vol. 198, No. 3, pp. 878-890, November 2008. [COA]

J. Todd Hamill, Richard F. Deckro, Robert F. Mills, and James W. Chrissis, "Reach-Based Assessment of Position," Military Operations Research, Vol. 13, No.4, pp. 59-78, 2008. [COA]

**COCHRAN, JEFFERY K., Department of Operational Sciences**

REFEREED JOURNAL PUBLICATIONS

Cochran, J.K., Kokangul, A., and Khaniyev, T., "Stochastic Approximations for Optimal Buffer Capacity of Many-Station Production Lines," International Journal of Mathematics in Operational Research 1:1/2, pp. 211-227 (2009). [COA]

Cochran, J.K. and Roche, K.T., "A Multi-class Queuing Network Analysis Methodology for Improving Hospital Emergency Department Performance," Computers and Operations Research 36:5, pp. 1497-1512 (2009). [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Broyles, J.R. and Cochran, J.K., "A Markov Chain Methodology for Predicting Hospital Inpatient Census," IIE Industrial Engineering Research Conference, pp. 832-827, Miami, FL (2009). [COA]

Cochran, J.K. and Roche, K.T., "Determining Bed Capacities Using Queuing Theory: A Whole Hospital View," IIE Industrial Engineering Research Conference, Invited Paper, pp. 856-861, Miami, FL (2009). [COA]

#### **BOOKS AND CHAPTERS IN BOOKS**

Burdick, T.L., Cochran, J.K., Andrews, R.A., Bucco, M.E., Broyles, J.R., and Roche, K.T., "Door to Doc Toolkit: Planning ED Capacity for Delivering Safe Care, Managing ED and Hospital Systems, Chapter 8, Shiver and Eitel editors, Taylor and Francis (2009). [COA]

Cochran, J.K. and Lewis, T.P., "Computing Small-Fleet Aircraft Availabilities Including Redundancy and Spares," Handbook of Military Industrial Engineering, Chapter 13, Badiru and Thomas editors, Taylor and Francis (2009). [COA]

#### **COOPER, MARTHA C., Department of Operational Sciences**

##### **REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW**

"Assessing Performance-Based Logistics Contract Results," Ferit Buyukgural, Martha Cooper, and Jeffrey Ogden, Productions and Operations Management Society (POMS) annual conference, Orlando, May 1-4, 2009. [COA]

"Career Patterns of Women in Logistics," Martha Cooper and Jan Macauley, Supply Chain and Logistics Canada Annual Conference, Toronto, April 28-29, 2009. [COA]

"Assessment of Large Aircraft Maintenance Inspection Strategies," Alan Johnson, Theodore Heiman, Martha Cooper, and Raymond Hill, Midwestern Decision Sciences Institute Conference, Oxford OH, 16-18 April 2009. [COA]

"Modeling the C-5 Isochronal Inspection Process," Martha Cooper, Theodore Heiman, Alan Johnson, Raymond Hill, Military Applications, INFORMS, Washington, D. C., Oct 12-15, 2008. [COA]

"2008 Career Patterns of Women in Logistics," Martha C. Cooper, Deborah Hurst, Alan Law, Julie Lockwood, John Santosa, and Didem Gurer, Council of Supply Chain Management Professionals Annual Conference, October 5-8. [COA]

Buyukgural, F., Cooper, M. and Ogden, J.A. (2009) "Assessing Performance-Based Logistics Contract Results," presented at the 20th Annual Conference of the Production and Operations Management Society, Orlando, Florida, May 2009 (input by Cherry from WAR & Dr. Ogden's AD Appraisal Reference). [COA]

Midwestern Decision Sciences Institute Conference, 16-18 April 2009, Oxford OH (with T. Heiman, M. Cooper, and R. Hill), "Assessment of Large Aircraft Maintenance Inspection Strategies." [COA]

#### **CUNNINGHAM, WILLIAM A., Department of Operational Sciences**

##### **REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW**

"Aggregating Aircraft Mission Capable Rates to Determine Total Aircraft Availability," INFORMS Annual Conference, October 13, 2008, Washington, DC. With John Johnson and Alan Johnson. [COA]

**DECKRO, RICHARD F., Department of Operational Sciences**

SPONSOR FUNDED RESEARCH PROJECTS

"AFIT Analysis Support to JIEDDO, Task 2b." Sponsor: JIEDDO. Funding: \$249,260. [COA]

**DONOVAN, PAMELA S., Lt Col, Department of Operational Sciences**

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Estridge, Christopher and Pamela S. Donovan, "Material Management at Military Healthcare Facilities," Production and Operations Management Society Annual Conference, Orlando, FL, 8 May 2009. [COA]

**HALL, SHANE N., Maj, Department of Operational Sciences**

REFEREED JOURNAL PUBLICATIONS

Hall, S.N., Jacobson, S.H., Sewell, E.C., 2008, "An Analysis of Pediatric Vaccine Formulary Selection Problems," Operations Research, 56(6), 1348-1365. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Geyer, A.J., Hall, S.N., and Moore, J.T., 2009, "Operations-focused Optimized Theater Weather Sensing Strategies Using Preemptive Binary Integer Programming," 77th Military Operations Research Society Symposium, United States Army Command and General Staff College, Fort Leavenworth, KS, June 16-18, 2009. [COA]

Williamson, D.L., Hall, S.N., Anderson, B.E., and Johnson, A.W., 2008, "Inland Troop Resupply Without a Road or Runway: Airdrop Solutions Including High-Altitude Precision Systems," INFORMS Annual Meeting, Washington, DC, October 12-15, 2008. [COA]

**HILL, RAYMOND R., Department of Operational Sciences**

SPONSOR FUNDED RESEARCH PROJECTS

"Analysis of Missile Miss Distance Data." Sponsor: OSD. Funding: \$25,000. [COA]

"Examining Experimental Methods for Missile Testing." Sponsor: Eglin AFB. Funding: \$20,000. [COA]

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- Leggio, D. A., R. R. Hill, A. G. Roesener, S. Capehart, "Examining Methods to Reduce Wind Tunnel Test Data Requirements using the Design of Experiments (DOE)," 77th Military Operations Research Society Symposium (MORSS), Ft. Leavenworth, KS, June 2009. [COA]
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- Hill, R. R. "Tutorial: Simulation-based Optimization for Military Applications," 2009 CORS/INFORMS Conference, Toronto, Canada, June 15-17, 2009. [COA]
- "Analyzing the C-5 High Velocity Regionalized Isochronal Inspection Concept" with T. Heiman, M. Cooper, and A. Johnson, INFORMS National Meeting, October 12-15 2008, Washington DC. [COA]
- "Center for Operational Analysis and TECP," 2009 Annual AF T&E Conference, Nellis AFB, Las Vegas, NV, January 27, 2009. [COA]
- "Assessment of Large Aircraft Maintenance Inspection Strategies" with T. Heiman, M. Cooper, and A. Johnson, Midwestern Decision Sciences Institute Conference, 16-18 April 2009, Oxford OH. [COA]
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- Moore, James T., J. Wesley Barnes, and Raymond R. Hill, "Modeling the End-to-End Military Transportation Problem" book chapter, Chapter 6, Handbook of Military Industrial Engineering, edited by Adedeji B. Badiru and Marlin U. Thomas, Taylor and Francis/CRC Press, 2009. [COA]
- Raymond R. Hill and Edward A. Pohl, "An Overview of Meta-Heuristics and their use in Military Modeling" book chapter, Chapter 9, Handbook of Military Industrial Engineering, edited by Adedeji B. Badiru and Marlin U. Thomas, Taylor and Francis/CRC Press, 2009. [COA]
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**JOHNSON, ALAN W., Department of Operational Sciences**

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Johnson, A.W., Michalski, S., Stiegelmeier, A., Pope, J., and Martindale, M., 2009, "Modeling Regeneration Time and Ground Support Manpower for a Reusable Launch Vehicle," Journal of Spacecraft and Rockets 46(1): 168-176. [COA]

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Midwestern Decision Sciences Institute Conference, 16-18 April 2009, Oxford OH (with T. Heiman, M. Cooper, and R. Hill), "Assessment of Large Aircraft Maintenance Inspection Strategies." [COA]

AIAA 34th Annual Dayton-Cincinnati Aerospace Symposium, 3 March 2009, Dayton OH (with C. Molina and A.G. Roesener), "Reusable Launch Vehicle Design Implications for Regeneration Time." [COA]

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**MATTIODA, DANIEL D., Maj, Department of Operational Sciences**

REFEREED JOURNAL PUBLICATIONS

Daugherty, Patricia J., Haozhe Chen, Daniel D. Mattioda, and Scott J. Grawe (2009), "Marketing/Logistics Relationships: Influence on Capabilities and Performance," Journal of Business Logistics, Vol. 30, No. 1, pp. 1-18. [COA]

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Huscroft Joseph R, Joseph Skipper, Dianne Hall, and Daniel Mattioda (2008), "Flexibility in the Supply Chain: Can Information Have a Negative Impact," International Society of Logistics (SOLE), Orlando, FL. [COA]

**MILLER, JOHN O., Department of Operational Sciences**

SPONSOR FUNDED RESEARCH PROJECTS

"Air Force Standard Analysis Toolkit Support." Sponsor: AF/A9B. Funding: \$40,000. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Miller, J.O., "Unmanned Aerial System Analysis Using Agent Based Modeling," Industrial Engineering Research Conference 2009, Miami, FL, June 2009. [COA]

**MILLS, ROBERT F., Department of Electrical and Computer Engineering**

REFEREED JOURNAL PUBLICATIONS

Hamill, J.T., Deckro, R.F., Mills, R.F., and Chrissis, J.W., "Reach-Based Assessment of Position," Military Operations Research, Vol. 13, No. 4, 2008, pp. 59-78. [COA]

**MOORE, JAMES T., Department of Operational Sciences**

SPONSOR FUNDED RESEARCH PROJECTS

"JDPAC and AFIT Distribution Research Proposal." Sponsor: USTRANSCOM. Funding: \$300,000. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Geyer, Andrew, Shane Hall, and James Moore, "Operations-focused Optimized Theater Weather Sensing Strategies," Military Operations Research Society Symposium, Fort Leavenworth, KS, 16-18 June 2009. [COA]

Kennedy, Kevin, Richard Deckro, James Moore, and Kenneth Hopkinson, "Targeting Closeness of Human Networks," Military Operations Research Society Symposium, Fort Leavenworth, KS, 16-18 June 2009. [COA]

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Moore, James, "Integer Formulations and Solutions to Magic Squares and Other Popular Games," Military Operations Research Society Symposium, Fort Leavenworth, KS, 16-18 June 2009. [COA]

Nance, R. Larry, August Roesener, and James Moore, "An Advanced Tabu Search Approach to Solving the Mixed Payload Aircraft Loading Problem," Military Operations Research Society Symposium, Fort Leavenworth, KS, 16-18 June 2009. [COA]

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**OGDEN, JEFFERY A., Department of Operational Sciences**

SPONSOR FUNDED RESEARCH PROJECTS

"ECSS Research Office." Sponsor: ECSS. Funding: \$35,048. [COA]

REFEREED JOURNAL PUBLICATIONS

Fawcett, S.E., Allred, C., Magnan, G., and Ogden, J.A. (2009) "Benchmarking the Viability of SCM for Entrepreneurial Business Model Design," Benchmarking: An International Journal, Vol. 16, No. 1, 5-29. [COA]

Foster, S. T. and Ogden, J.A. (2008) "On Differences in How Operations and Supply Chain Managers Approach Quality Management," International Journal of Production Research, Vol. 46, No. 24, 6945-6961. [COA]

Ogden, J. A., Lowry, P.B., Petersen, K.J. and Carter, P.L. (2008) "Explaining the Key Elements of Supply-Chain Strategy that are Necessary for Business-to-Business Electronic Marketplace Survival," Supply Chain Forum: An International Journal, Vol. 9, No. 1, 92-110. [COA]

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Ogden, J.A. and Sprague, T. (2009) "Effective Training and Education Processes for Large Scale IT Implementations," presented at the 20th Annual Conference of the Production and Operations Management Society, Orlando, Florida, May 2009. [COA]

Buyukgural, F., Cooper, M. and Ogden, J.A. (2009) "Assessing Performance-Based Logistics Contract Results," presented at the 20th Annual Conference of the Production and Operations Management Society, Orlando, Florida, May 2009. [COA]

Ogden, J.A., Swartz, S., Randall, W., Donovan, P. and Brady, S. (2009) "Logistics Research in the Public Sector," presented at the 20th Annual Conference of the Production and Operations Management Society, Orlando, Florida, May 2009. [COA]

**OXLEY, MARK E., Department of Mathematics and Statistics**

SPONSOR FUNDED RESEARCH PROJECTS

"Fusion of Disparate Sensor Exploitation Systems." Sponsor: AFOSR. Funding: \$47,200. [COA]

"Fusion of Disparate Sensor Systems." Sponsor: NASIC. Funding: \$20,000. [COA]

**PERRAM, GLEN P., Department of Engineering Physics**

SPONSOR FUNDED RESEARCH PROJECTS

"AFIT Analysis Support to JIEDDO Task 2b." Sponsor: JIEDDO. Funding: \$47,436. [COA]



**PETERSON, GILBERT L., Department of Electrical and Computer Engineering**

**SPONSOR FUNDED RESEARCH PROJECTS**

"AFIT Analysis Support to JIEDDO, Task 2a." Sponsor: JIEDDO. Funding: \$116,760. [COA]

**PETTIT, TIMOTHY J., Lt Col, Department of Operational Sciences**

**SPONSOR FUNDED RESEARCH PROJECTS**

"Research, Analysis, and Transition Support to the Director of Logistics and Sustainment Air Force Material Command." Sponsor: HQ AFMC. Funding: \$200,000. [COA]

"Supply Chain Resilience in a Global Enterprise." Sponsor: The Ohio State University Research Foundation. Funding: \$44,000. [COA]

**REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW**

"Resilience of Emergency Management: Assessment and Benchmarking for Maximization of Mission Effectiveness," Timothy J. Pettit, CORS-INFORMS Joint International Conference, 16 Jun 09, Toronto, Canada. [COA]

**ROESENER, AUGUST G., Maj, Department of Operational Sciences**

**REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW**

Johnson, A.W., C. Molina and A.G. Roesener. "Reusable Launch Vehicle Design Implications for Regeneration Time," American Institute of Aeronautics and Astronautics 34th Annual Dayton-Cincinnati Aerospace Symposium, Dayton, OH, March 3, 2009. [COA]

Nance, R. L., A. G. Roesener and J. T. Moore. "An Advanced Tabu Search for Solving the Mixed Payload Airlift Loading Problem." 77th Military Operations Research Society Symposium, Fort Leavenworth, KS, June 16-18, 2009. [COA]

Cohen, A.N., R.R Hill, A.G. Roesener and S.R. Capehart. "Examining the Use of Split-Plot Designs and Their Potential Use in Operational Testing." 77th Military Operations Research Society Symposium, Fort Leavenworth, KS, June 16-18, 2009. [COA]

Leggio, D., R.R Hill, A.G. Roesener and S.R. Capehart. "Examining Methods to Reduce Wind Tunnel Test Data Requirements Using The Design of Experiments (DOE)." 77th Military Operations Research Society Symposium, Fort Leavenworth, KS, June 16-18, 2009. [COA]

**SKIPPER, JOSEPH B., Maj, Department of Operational Sciences**

**SPONSOR FUNDED RESEARCH PROJECTS**

"Leading Edge Supply Chain: Identifying Ways to Improve Weapon Systems Sustainment and Logistics Support." Sponsor: AFRL/RX. Funding: \$90,000. [COA]

#### REFEREED JOURNAL PUBLICATIONS

Skipper, Joseph, Joseph Huscroft, Daniel Mattioda, and Dianne Hall, (2008) "Supply Chain Organizational Flexibility and Information Technology's Confounding Effects," Logistics Spectrum, Vol 42, No 3, pp. 11-20. [COA]

Skipper, Joseph, Dianne Hall, Joe Hanna (2009), "Top Management Support, External and Internal Organizational Collaboration, and Organizational Flexibility in Preparation for Extreme Events," Journal of Information System Security, Vol 5, No 1, pp. 32-60. [COA]

Skipper, Joseph, Joe Hanna, Casey Cegielski (2009), "Supply Chain Contingency Planning and Firm Adoption: An Initial Look at Differentiating the Innovators," Transportation Journal, Spring 2009, Vol 48, No 2, pp. 40-62. [COA]

**WEIR, JEFFERY D., Department of Operational Sciences**

#### SPONSOR FUNDED RESEARCH PROJECTS

"AFIT Analysis Support to JIEDDO, Task 1a." Sponsor: JIEDDO. Funding: \$587,560. [COA]

#### REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

77th Military Operations Research Society Symposium 16-18 Jun 2009, "Creating Multi Objective Value Functions for Additive Value Models," Christopher Richards and Jeffery Weir. [COA]

10th Annual Decision Analysis Affinity Group Conference 19-20 May 2009, Invited Speaker "Case Study: Joint Improvised Explosive Device Defeat Organization Value Modeling," Jeffery Weir, Kenneth Bauer, Shane Knighton, Christina Willy and Christopher Richards. [COA]

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\*Faculty Bios can be found under their respective department listings.

#### **COLOMBI, JOHN M., Department of Systems and Engineering Management**

##### SPONSOR FUNDED RESEARCH PROJECTS

"Human System Integration (HSI) Architectural and Empirical Methods." Sponsor: 711 HPW/RH. Funding: \$30,000. [CSE]

#### **HEMINGER, ALAN R., Department of Systems and Engineering Management**

##### SPONSOR FUNDED RESEARCH PROJECTS

"Supporting a Process View of Work at the Defense Ammunition Center." Sponsor: Defense Ammunition Center. Funding: \$96,332. [CSE]

#### **JACQUES, DAVID R., Department of Systems and Engineering Management**

##### SPONSOR FUNDED RESEARCH PROJECTS

"Tailored Application of Systems Engineering for Rapid Prototyping and Transition." Sponsor: SAF. Funding: \$25,000. [CSE]

##### SPONSOR FUNDED EDUCATIONAL PROJECTS

"Space System Engineering Case Studies." Sponsor: SAF. Funding: \$60,000. [CSE]

#### **SONI, SOM R., Department of Systems and Engineering Management**

##### SPONSOR FUNDED RESEARCH PROJECTS

"Composite Materials and Technology Airframe Cost Comparison." Sponsor: AFRL/RB. Funding: \$12,500. [CSE]

"Intermediate Strain Rate Investigation of Fiber Metal Laminates." Sponsor: AFRL/RB. Funding: \$7,000. [CSE]

"Validation of Damage Through Inspection of Composite Joints with Z-Pins." Sponsor: DAGSI. Funding: \$20,000. [CSE]

## APPENDICES

### APPENDIX A: POST-DOCTORAL AND OTHER RESEARCH ASSOCIATES CREDENTIALS

**ALLEN, CHRISTOPHER**, Research Engineer in Mechanical Engineering, Department of Aeronautics and Astronautics, AFIT Appointment Date: 2008 (AFIT/ENY); BS, Biomedical Engineering, 2006; MS, Optimization of an Aircraft's Thermal Management Using A Genetic Algorithm, Wright State University, Dayton, OH, 2008. Chris Allen is a researcher working on fusing autonomous navigation with sensors and videogrammetry systems. Tel. 937-255-3636 x7495, email: [Christopher.Allen@afit.edu](mailto:Christopher.Allen@afit.edu)

**MOORE, ELIZABETH A.**, Research Associate in Semiconductor Physics, Department of Engineering Physics, AFIT Appointment Date: 2008 (AFIT/ENP); BS, Physics, University of Cincinnati, Cincinnati, OH, 2001; MS (2003) and PhD (2007), Semiconductor Physics, Department of Engineering Physics, Air Force Institute of Technology. Dr. Moore specializes in electrical and optical characterization of various semiconducting materials including wide band gap semiconductors. Tel. 937-255-3636 x7945 (DSN 785-3636 x7945), email: [Elizabeth.Moore@afit.edu](mailto:Elizabeth.Moore@afit.edu)

**O'NEAL, JEROME**, Research Assistant in Operations Research, Department of Operational Sciences, AFIT Appointment Date: 2006 (AFIT/ENS); BS, Mathematics and Foreign Languages, U.S. Military Academy at West Point, 1993; MS, Operations Research, Georgia Institute of Technology, 2004; PhD, Industrial and Systems Engineering, Georgia Institute of Technology, 2005. Dr. O'Neal specializes in mathematical optimization, including interior-point methods and integer programming. He is also interested in business and social science applications of mathematical optimization.

**PERCIVAL, SCOTT A.**, Research Associate in Operations Research, Department of Operational Sciences, AFIT Appointment Date: 2007 (AFIT/ENS); Center for Operational Analysis (COA), BS, Operations Research, United States Air Force Academy, 2001; MS, Operations Research, Air Force Institute of Technology, 2003; Mr. Percival specializes in applied statistics, specifically multivariate analysis applied to Hyper-Spectral Imagery.

**RYU, MEE YI**, Research Associate in Semiconductor Physics, Department of Engineering Physics, AFIT Appointment Date: 2006 (AFIT/ENP); BS, Physics, Yeungnam University, Taegu, Korea, 1995; MS (1997) and PhD (2001), Semiconductor Physics, Department of Information and Communications, Gwangju Institute of Science and Technology, Gwangju, Korea. Dr. Ryu is a faculty member of Department of Physics, Kangwon National University, Chunchon, Kangwondo, Korea. She specializes in electrical, optical, and magnetic characterization of various semiconducting materials including dilute magnetic wide band gap semiconductors. Tel. 937-255-3636 x7305 (DSN 785-3636 x7305), email: [Mee.Ryu@afit.edu](mailto:Mee.Ryu@afit.edu)

**SABELKIN, VOLODYMYR**, Researcher, Department of Aeronautics and Astronautics, AFIT Appointment Date: 2003 (AFIT/ENY); MS, Kharkov Aviation Institute, Ukraine, 1976; PhD, Kharkov Aviation Institute, Ukraine, 1980; Dr. Sci., Kharkov Aviation Institute, Ukraine, 1989; Professor, Kharkov Aviation Institute, Ukraine, 1991. Dr. Sabelkin has authored over 60 papers and 100 patents. Dr. Sabelkin's research interests are on composite and smart materials, fatigue and fracture, contact mechanics, micromechanics, plasticity and modeling. Tel. 937-255-3636 x7476 (DSN 785-3636 x7476), email: [Volodymyr.Sabelkin@afit.edu](mailto:Volodymyr.Sabelkin@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.

664 AESS	664 <sup>th</sup> Aeronautical Systems Squadron
711 HPW/RH	AFRL 711 <sup>th</sup> Human Performance Wing Human Effectiveness Directorate
82 TRW	82 <sup>nd</sup> Training Wing
86 <sup>th</sup> FWS	86 <sup>th</sup> Fighter Wing Squadron
ACC	Air Combat Command
ACES	Applied Computational Electromagnetic Society
AETC	Air Education and Training Command
AFCA	Air Force Communication Agency
AFCEE	Air Force Center for Environmental Excellence
AFCESA	Air Force Civil Engineer Support Agency
AFCYBER	Air Force Cyber Command
AFELM	Air Force Elements
AFIT	Air Force Institute of Technology
AFLMA	Air Force Logistics Management Agency
AFMC	Air Force Materiel Command
AFOTEC	Air Force Operational Test and Evaluation Center
AFRL	Air Force Research Laboratory
AFRL/AFOSR	AFRL/Air Force Office of Scientific Research
AFRL/RB	AFRL/Air Vehicles Directorate
AFRL/RD	AFRL/Directed Energy Directorate
AFRL/RI	AFRL/Information Directorate
AFRL/RX	AFRL/Materials and Manufacturing Directorate
AFRL/RW	AFRL/Munitions Directorate
AFRL/RZ	AFRL/Propulsion Directorate
AFRL/RY	AFRL/Sensors Directorate
AFRL/RV	AFRL/Space Vehicles Directorate
AFPC	Air Force Personnel Center
AFSA	Air Force Security Agency
AFSEO	Air Force Seek Eagle Office (46 SK/SKE)
AFSPC	Air Force Space Command
AFTAC	Air Force Technical Applications Center
AFWA	Air Force Weather Agency
AHS	American Helicopter Society
AIA	Air Intelligence Agency
AIAA	American Institute of Aeronautics and Astronautics
AMC	Air Mobility Command
ARDA	Advanced Research and Development Activity
ASME	American Society of Mechanical Engineers
ASC	Aeronautical Systems Center
AU	Air University
DAGSI	Dayton Area Graduate Studies Institute
DARPA	Defense Advanced Research Projects Agency
DETEC	Directed Energy Test and Evaluation Capability
DISA	Defense Information Systems Agency
DoD	Department of Defense
DOE	Department of Energy
DoS	Department of State
DTRA	Defense Threat Reduction Agency
HQ AFPC	Air Force Personnel Center
IEEE	Institute of Electrical and Electronics Engineers
INCOSE	International Council on Systems Engineering

ISSMO	International Society for Structural and Multidisciplinary Optimization
MORS	Military Operations Research Society
NASA	National Aeronautics and Space Administration
NASIC	National Air and Space Intelligence Center
NSA	National Security Agency
NSF	National Science Foundation
NSSA	National Security Space Architect
NSSO	National Security Space Office
OSD	Office of the Secretary of Defense
PACAF	Pacific Air Forces
ROKA	Republic of Korea Army
SAE	Society of Automotive Engineers
SAF	Office of the Secretary of the Air Force
SPIE	The International Society for Optical Engineering
TuAF	Turkish Air Force
USACE	United States Army Corps of Engineers
USAF	United States Air Force
USAFSAM	United States Air Force School of Aerospace Medicine
USCENTCOM	United States Central Command
USNA	United States Naval Academy
USSOCOM	United States Special Operations Command
USSTRATCOM	United States Strategic Command
USTRANSCOM	United States Transportation Command
WPAFB	Wright-Patterson Air Force Base

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