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Air Force Institute of Technology

Research Report 2010

Period of Report: 1 October 2009 to 30 September 2010

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

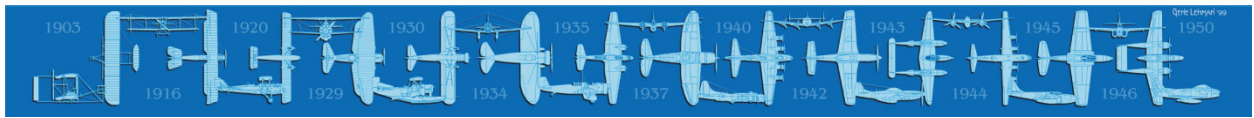
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This report was edited and produced by the Office of Research and Sponsored Programs, Graduate School of Engineering and Management, Air Force Institute of Technology. The Department of Defense, other federal government, and non-government agencies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

For additional information, please call or email:

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research@afit.edu

or visit the AFIT website: www.afit.edu



Air Force Institute of Technology Research Report 2010 Foreword

Research programs at the Air Force Institute of Technology (AFIT) are an integral component of our graduate education mission, while addressing both immediate and long-term warfighter needs. AFIT's Advanced Navigation Technology Center, Center for Cyberspace Research, Center for Directed Energy, Center for Operational Analysis and other research groups are focused on priorities identified in the United States Air Force Chief Scientist's report *Technology Horizons, A Vision for Air Force Science and Technology During 2010-2030*, and the *Air Force Science & Technology Strategy 2010* signed by the Chief of Staff and Secretary of the Air Force.

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 summarize 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. Additional information is available at <http://www.afit.edu/en/enr/index.cfm>.

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



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1. INTRODUCTION

1.1. OVERVIEW

This Research Report presents the FY10 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.

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. 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 2010-2011 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.

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 **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
Biostatistics
Category Theory
Optimization
Design of Experiments
Electromagnetics

Information Fusion
Categorical Data Analysis
Functional Analysis
Numerical Analysis
Partial Differential Equations
Wavelets

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

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

Applied Environmental Sciences
Computer and Network Security
Construction Management
Cost Analysis
Cyberlaw and Cyberwar
Design and Analysis of Experiments
Ecological Engineering
Facility and Infrastructure Management
Fuels Microbiology
Geographical Information Science
Human Systems Integration

Image and Display Science
Information Assurance and Security
Infrastructure Asset Management
Product Design and Development
Project Management
Reliability Engineering
Strategic Decision Support
Structural Health Monitoring
Sustainability and Life Cycle Assessment
Systems Engineering

Another avenue for educational and research collaboration with the Graduate School of Engineering and Management is through association with one or more of **AFIT's Research Centers**. A brief listing of each Center's research or educational areas of emphasis appears below. Please contact the Centers directly (see 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 (HELs), high power microwaves (HPMs), and their enabling technologies. The Center is an advocate for transitioning these systems to the battlefield through vigorous scientific and engineering research, graduate education programs and diverse consulting activities.

The **Center for 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 DOD 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, 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 Department of Defense. 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.

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

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

Franke, Milton E., Professor Emeritus of Aerospace Engineering, Department of Aeronautics and Astronautics, Fellow of the American Society of Mechanical Engineers.

Goltz, Mark N., Professor of Engineering and Environmental Management, Department of Systems Engineering and Management, Fellow of the Society of American Military 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.

Pignatiello, Joseph J., Professor of Systems Engineering, Department of Systems Engineering and Management, Fellow of the American Society for Quality.

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 and Management, 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

Ahner, Darryl K., Registered Professional Engineer (PE), Commonwealth of Virginia

Akers, Geoffrey A., Level 2 Space Professional

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

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

Badiru, Adedeji B., Certified Project Management Professional (PMP)

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)

Feng, Peter P., Professional Engineer, State of North Carolina

Feng, Peter P., Professional Engineer, State of Nevada

Fisher, Kenneth A., Certified Acquisition Professional, Level 1, Systems Planning, Research, Development and Engineering

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., Certified Supervisory Control and Data Acquisition (SCADA) Security Architect (CSSA),
Information Assurance Certification Review Board

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

Sitzabee, William E., Professional Engineer, State of North Carolina

Sitzabee, William E., Certified Geographical Information Science Professional

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

Stepaniak, Michael J., Senior Member of the American Institute of Aeronautics and Astronautics (AIAA)

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

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.

2010 ASEE John L. Imhoff Global Excellence Award for Industrial Engineering Education.

2010 IIE/Joint Publishers Book-of-the-Year Award for “Handbook of Military Industrial Engineering,”
Institute of Industrial Engineers.

2009 Editor’s Choice Award for “The Physics of Soccer: Using math and science to improve your game,”
iUniverse, Inc., November 2009.

BALDWIN, RUSTY O.

Inducted into the Tau Beta Pi as Eminent Engineer.

BAUER, KENNETH W.

Department of Operational Sciences Faculty of the Quarter, Fall 2009 (student nominated award).

BORGHETTI, BRETT J., Lt Col

Air Education and Training Command Outstanding Senior Military Scientist Award.

Air Force Institute of Technology Field Grade Officer of the Quarter, July-September 2010.

CHAMBAL, STEPHEN P., Lt Col

2009 Colonel Charles A. Stone Award, awarded by the AFIT Board of Visitors, given in recognition of an individual who accomplished specific achievements that furthered the AFIT mission. Emphasis is on new, innovative efforts or approaches involving demonstrated personal leadership, May 2010.

CHRISSIS, JAMES W.

Koopman Prize, Hamill, Todd J., Richard F. Deckro, Robert F. Mills, and James W. Chrissis, “Reach-Based Assessment of Position,” published in Military Operations Research, Vol. 13, No 4, (2008), pp. 59-78, was the winner of the 2008 INFORMS Koopman prize (awarded Oct 2009) for the best published paper or published report in 2008 on military operations research topics directly related to the goals of Military Applications Society. This publication came out of Lt Col Hamill’s dissertation work.

COCHRAN, JEFFERY K.

Meritorious Civilian Service Award, Department of the Air Force, May 2010, received in recognition recognition of his exemplary leadership and professional excellence as Department Head, Department of Operational Sciences, Graduate School of Engineering and Management from 2 July 2007 to 30 December 2009.

COUTU, RONALD, A., Jr.

Air Education and Training Command Engineer of the Year, Senior Civilian Category, 2010.

Air Education and Training Command nominee for Air Force Engineer of the Year, Senior Civilian Category, 2010.

Best Paper Award for the 11th International Symposium on MEMS and Nanotechnology, Society of Experimental Mechanics Annual Conference, 2010.

CUNNINGHAM, WILLIAM A.

Best Paper, Bell, John, Stanley Griffis, William Cunningham, "Location Analysis: A Strategic Network for Homeland Defense," was chosen as the Best Paper at the Western Decision Sciences Institute annual meeting 6-9 Apr 10 at Lake Tahoe, NV. Their research was chosen from a total of 118 papers at the conference.

DECKRO, RICHARD F.

2009 Air Force Analyst Lifetime Achievement Award, Nov 2009. The Air Force Analyst Lifetime Achievement Award recognizes those scientific and research analysts or government contractors whose career accomplishments and achievements have had a significant effect on the Air Force Analytic Community.

Koopman Prize, Hamill, Todd J., Richard F. Deckro, Robert F. Mills, and James W. Chrissis' paper "Reach-Based Assessment of Position," published in Military Operations Research, Vol. 13, No 4, (2008), pp. 59-78, was the winner of the 2008 INFORMS Koopman prize (awarded Oct 2009) for the best published paper or published report in 2008 on military operations research topics directly related to the goals of Military Applications Society. This publication came out of Lt Col Hamill's dissertation work.

DILLARD, KAREN E. M., Lt Col

2010 Faculty Excellence in Teaching Award, Southwestern Ohio Council for Higher Education, April 2010.

FICKUS, MATTHEW C.

2009 Gage H. Crocker Outstanding Professor Award, May 2010.

GROSS, KEVIN C.

2010 USAF Science & Engineering Team Award for Exploratory or Advanced Technology Development.

2009 AFIT Graduate School Science and Technology Award, Mid-Career Civilian Scientist.

HARMON, FREDERICK G., Lt Col

Professor Ezra Kotcher Award, 2009.

HALL, SHANE N., Maj

Capt Andrew J. Geyer, Maj Shane N. Hall, and James T. Moore, "Operations-focused Optimized Theater Weather Sensing Strategies," selected best paper in their respective working groups at the 77th Military Operations Research Symposium, Fort Leavenworth, KS, June 2009; announced subsequent to the symposium; nominated for the Barchi Prize.

Department of Operational Sciences Faculty of the Quarter, Summer 2009 (student nominated award).

HAWKS, MICHAEL R., Lt Col

2010 USAF Science & Engineering Team Award for Exploratory or Advanced Technology Development.

HENGHOLD, ROBERT L.

Thomas More College Alumni Award for Professional Achievement, October 2009.

HILL, RAYMOND R.

Capt Allen N. Cohen, Raymond R. Hill, and Maj A.G. Roesener, "Examining the Use of Split-Plot Designs and their Potential Use in Operational Testing," selected best paper in their respective working groups at the 77th Military Operations Research Symposium, Fort Leavenworth, KS, June 2009; announced subsequent to the symposium; nominated for the Barchi Prize.

HOPKINSON, KENNETH M.

Air Force Institute of Technology Junior Civilian Scientist of the Year, 2010.

Air Force Institute of Technology Graduate School Junior Civilian Scientist of the Year, 2010.

HUMPHRIES, JEFFREY W., Lt Col

2010 Excellence in Teaching Award, Southwestern Ohio Council for Higher Education.

2009 Outstanding Military Faculty of the Year, Department of Electrical and Computer Engineering.

2009 Field Grade Officer of the Quarter, Department of Electrical and Computer Engineering, October-December 2009.

KIM, YONG C.

2009 Air Force Institute Civilian of the Quarter, Category III, 4th Quarter Winner, October-December 2009.

MARTIN, RICHARD K.

Air Education and Training Command nomination for the 2010 Air Force Science, Technology and Engineering Awards: Air Force Outstanding Engineer, Junior Civilian Category.

McCLORY, JOHN W., LTC

Excellence in Teaching Award, Southwestern Ohio Council for Higher Education (SOCHE), 2010.

AFIT Outstanding Military Professor Award sponsored by the Military Officers Association of America for the period of January – December 2009.

Defense Threat Reduction Agency (DTRA) Director's Annual Large Team Award, 2009.

MENDENHALL, MICHAEL J., Maj

Air Force Institute of Technology Student Association Dr. Leslie M. Norton Teaching Excellence Award, March 2010.

Air Education and Training Command's Air Force Submission for: John L. McLucas Basic Research Award, 2010.

Air Force Honorable Mention for: John L. McLucas Basic Research Award, 2010.

Air Education and Training Command Outstanding Mid-Career Military Engineer, 2010.

MILLER, JOHN O.

Department of Operational Sciences Faculty of the Quarter, Winter 2010 (student nominated award).

MOORE, JAMES 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; announced subsequent to the Symposium; nominated for the Barchi Prize.

Maj R. Larry Nance, Maj A. G. Roesener, and Dr. James T. Moore, "An Advanced Tabu Search Approach to Solving the Mixed Payload Aircraft Loading Problem," selected best paper in their respective working groups at the 77th Military Operations Research Symposium, Fort Leavenworth, KS, June 2009; announced subsequent to the symposium; nominated for the Barchi Prize.

Capt Andrew J. Geyer, Maj Shane N. Hall, and James T. Moore, "Operations-focused Optimized Theater Weather Sensing Strategies," selected best paper in their respective working groups at the 77th Military Operations Research Symposium, Fort Leavenworth, KS, June 2009; announced subsequent to the symposium; nominated for the Barchi Prize.

MULLINS, BARRY E.

Air Force Science and Engineering Educator of the Year, August 2010.

Air Force Institute of Technology Cyberspace Research Excellence Award, M. L. Stamat, March 2010.

Air Force Institute of Technology Polk Award, B. D. Thomas, June 2010.

Air Force Institute of Technology Department of Electrical and Computer Engineering nominee for Air Force Educator of the Year.

OGDEN, JEFFREY A.

Outstanding Paper, Fawcett, S.E., Allred, C., Magnan, G., and Ogden, J.A. (2009) "Supply Chain Management and Entrepreneurial Business Model Design: A Viability Assessment," Benchmarking: An International Journal, Vol. 16, No. 1, 5-29. Article received the outstanding paper award 2009 Emerald Literati Network Awards for Excellence---Outstanding Paper Competition, March 2010.

PERRAM, GLEN P.

2010 USAF Science & Engineering Team Award for Exploratory or Advanced Technology Development.

PETERSON, GILBERT L.

Air Education and Training Command Outstanding Mid-Career Civilian Scientist.

Mentor of Team Little Bobby Tables Winner of the DC3 Digital Forensics Challenge.

PETTIT, TIMOTHY J., Lt Col

Received Doctoral Dissertation Award (2009) from the Council for Supply Chain Management Professions (CSCMP) for his dissertation titled, "Supply Chain Resilience: Development of a Conceptual Framework, as Assessment Tool and an Implementation Process, presented at the annual conference in Chicago, IL.

RACZ, LEEANN, Maj,

Recipient, American Water Resources Association Utah Section, Student Conference and Scholarship Competition, 2010.

RAQUET, JOHN F.

Fulbright Scholar at Tampere University of Technology, Tampere, Finland, January-June 2010.

RIES, HEIDI R.,

Ten Top Women Award, Dayton Daily News, 2009.

ROESENER, AUGUST G., Maj

Southwestern Ohio Council for Higher Education (SOCHE) Faculty Excellence in Teaching Award, 2010.

Department of Operational Sciences Faculty of the Quarter, Spring 2010 (student nominated award.)

Capt Allen N. Cohen, Raymond R. Hill, and Maj A.G. Roesener, "Examining the Use of Split-Plot Designs and their Potential Use in Operational Testing," selected best paper in their respective working groups at the 77th Military Operations Research Symposium, Fort Leavenworth, KS, June 200; announced subsequent to the symposium; nominated for the Barchi Prize.

Maj Larry Nance, Maj A. G. Roesener, and Dr. James T. Moore, "An Advanced Tabu Search Approach to Solving the Mixed Payload Aircraft Loading Problem," selected best paper in their respective working groups at the 77th Military Operations Research Symposium, Fort Leavenworth, KS, June 2009; announced subsequent to the symposium; nominated for the Barchi Prize.

SANDLIN, DORAL E., Lt Col

SOLE Dissertation Proposal Award winner 2009, awarded by the International Society of Logistics during President's Award Luncheon at the annual International Symposium in Dallas, Texas.

Instructor of the Year awarded by the Advance Study in Air Mobility Class of 2010, Ft. Dix, New Jersey, June 2010.

SCHMIDT, JASON D., Maj

2009 Harold Brown Award nominee.

2009 HKN nominee for C. Holmes MacDonald Outstanding Teaching Award.

SKIPPER, JOSEPH B., Lt Col

Outstanding Paper Award, Lt Col Joseph B Skipper's article entitled "Minimizing Supply Chain Disruption Risk through Enhanced Flexibility" published in the International Journal of Physical Distribution & Logistics Management was chosen as the Outstanding Paper Award Winner at the Emerald Publishing Literati Network Awards for Excellence 2010. It was selected as one of the most impressive research articles seen throughout 2009 by the journal's Editorial Team.

Best Paper, 2010 International Journal of Physical Distribution and Logistics Management 'Best Paper' Award. "Managing Supply Chain Disruptions" was chosen by the Editor(s) of International Journal of Physical Distribution & Logistics Management, and the rest of judging panel, as a Highly Commended Award winner of the 2009 Emerald/EFMD Outstanding Doctoral Research Awards in the Logistics and Supply Chain Management category.

SWENSON, ERIC D., Lt Col

Most Outstanding Military Instructor of the Year, Department of Aeronautics and Astronautics, March 2010.

THOMAS, MARLIN U.

Industrial and Operations Engineering Alumni Merit Award, University of Michigan, 2010.

2010 IIE/Joint Publishers Book-of-the-Year Award for "Handbook of Military Industrial Engineering," Institute of Industrial Engineers.

TRIAS, ERIC D., Maj

Eta Kappa Nu Honor Society (Delta Xi Chapter), Outstanding Faculty of the Year, 2009.

Co-advisor of winning team of annual DOD Cyber Crime Center Digital Forensics Challenge, 2009.

VETH, MICHAEL J., Lt Col

Air Education and Training Command nominee for Air Force Outstanding Military Engineer, 2010 IEEE Senior Member.

WEIR, JEFFERY D.

Department of Operational Sciences Faculty of the Quarter, Summer 2010 (student nominated award).

2.3.2. RESEARCH ASSISTANTS, ASSOCIATES & POST-DOCTORALS

ALLEN, CHRISTOPHER C.

National Society of Black Engineers Aerospace Systems Conference, Best Paper Award, 2010.

2.3.3. STUDENTS

ANDERSON, JOEL R.

Louis F. Polk Award, March 2010.

BOSTON, JON

Best of Thesis for Mechanics and Materials, Department of Aeronautics and Astronautics, 2010.

American Institute of Aeronautics and Astronautics DCASS Best Presentation, 2010.

American Institute of Aeronautics and Astronautics SDM Finalist Best Student Paper, 2010.

BROOKS, ADAM L.

Distinguished Graduate Winner, Association of Old Crows Electronic Defense Category; Department of Electrical and Computer Engineering Louis F. Polk Award Recipient for addressing research relevant to the National Defense Industrial Association, March 2010.

BUTLER, SAMUEL D.

Melvin E. Gross Award, March 2010.

CASEY, BRANDON A.

2010 Jerome G. Peppers, Jr. Outstanding Student Award, International Society of Logistics (SOLE), June 2010, awarded for his academic record and contributions to the field of logistics. Thesis Title: "Airlift Cargo Hub Port Hold Times: Controlling Variations in Defense Supply Chain Delivery."

CHESTERMAN, MICHAEL C.

2010 Dean's Award, March 2010, for the most exceptional master's theses by a graduating student in the Department of Aeronautics and Astronautics. Thesis: "Collateral Damage Effects of Directed Energy Weapons."

Best of Thesis for Fluids, Department of Aeronautics and Astronautics, 2010.

American Institute of Aeronautics and Astronautics Dayton-Cincinnati Graduate Student Award for Research Excellence, 2010.

COHEN, ALLEN N.

Capt Allen N. Cohen, Raymond R. Hill, and Maj A.G. Roesener, "Examining the Use of Split-Plot Designs and their Potential Use in Operational Testing," selected best paper in their respective working groups at the 77th Military Operations Research Symposium, Fort Leavenworth, KS, June 2009; announced subsequent to the symposium; nominated for the Barchi Prize.

DeGREGORIA, ANTHONY J.

Best of Thesis for Controls, Department of Aeronautics and Astronautics, 2010.

Air University First Place Blue Dart, 2010.

ESTEP, NICHOLAS

IEEE Dayton Section student award, "High Power Microwave (HPM) and Ionizing Radiation Effects on CMOS Devices," April 2010.

FAIRCHILD, IAN M.

2010 Lt Edwin E. Aldrin, Sr, Award, March 2010, awarded in recognition of exceptional leadership as well as high quality academic accomplishments. Thesis title: "Securing Information Exchange Between the 618 TACC and its Civilian Airlift Partners."

GEYER, ANDREW J.

Best Paper: Capt Andrew J. Geyer, Maj Shane N. Hall, and James T. Moore, "Operations-focused Optimized Theater Weather Sensing Strategies," selected best paper in their respective working groups at the 77th Military Operations Research Symposium, Fort Leavenworth, KS, June 2009; announced subsequent to the symposium; nominated for the Barchi Prize.

HAMILL, J. TODD

Koopman Prize; Hamill, J. Todd, Richard F. Deckro, Robert F. Mills, and James W. Chrissis' paper, "Reach-Based Assessment of Position," published in Military Operations Research, Vol. 13, No 4, (2008), pp. 59-78, was the winner of the 2008 INFORMS Koopman prize (awarded Oct 2009) for the best published paper or published report in 2008 on military operations research topics directly related to the goals of Military Applications Society. This publication came out of Lt Col Hamill's dissertation work (December 2006 graduate).

HERR, NICHOLAS C.

2010 Dean's Award, March 2010, for the most exceptional master's theses by a graduating student in the Department of Engineering Physics. Thesis: "AFM-Patterned 2-D Thin-Film Photonic Crystal Analyzed by Complete Angle Scatter."

HORENZIAK, MICHAEL W.

2010 Dean's Award, March 2010, for the most exceptional master's theses by a graduating student in the Department of Systems and Engineering Management. Thesis: "Low Dose Sarin Leads to Murine Cardiac Dysfunction."

JEONG, GREG S.

2010 Military Operations Research Society (MORS) Award, March 2010, awarded for the graduate research project judged to demonstrate the best application of operations research methodology or theory development to a military problem. Thesis title: "A Multi-Objective Approach To A Bipartite Assignment Matching Problem Using Weighted Values From Multiple Constraints."

KIMAZ, EVREN

2010 Jerome G. Peppers, Jr. Outstanding Student Award, International Society of Logistics (SOLE), March 2010, awarded for his academic record and contributions to the field of logistics. Thesis title: "Fuel Efficiency Assessment with DEA."

LeBLANC, KEITH

Institute of Navigation Student Research Award, 2010.

MACDONALD, DOUGLAS J.

Measurement and Signatures Intelligence (MASINT) Committee Award of Academic Excellence, March 2010.

MEIER, DAVID C.

Lt Edwin E. Aldrin, Sr., Award, March 2010.

MORRISON, PHILIP G.

2010 Military Operations Research Society (MORS) Award, June 2010, awarded for the graduate research project judged to demonstrate the best application of operations research methodology or theory development to a military problem. Thesis title: "Reballasting the KC-135 Fleet for Fuel Efficiency."

NANCE, ROBERT L.

Maj R. Larry Nance, Maj A. G. Roesener, and Dr. James T. Moore, "An Advanced Tabu Search Approach to Solving the Mixed Payload Aircraft Loading Problem," selected best paper in their respective working groups at the 77th Military Operations Research Symposium, Fort Leavenworth, KS, June 2009; announced subsequent to the symposium; nominated for the Barchi Prize.

OYAMA, KYLE

Best Paper Award, Conference on Systems Engineering Research, 2010.

PELLIZZARI, CASEY J.

2010 Commandant's Award, March 2010, for the most exceptional master's theses by a graduating student. Thesis: "Phase Unwrapping in the Presence of Strong Turbulence."

SCHULER, WESLEY, A.

Secretary James G. Roche Award, March 2010.

Advanced Technical Intelligence Association (ATIA) Outstanding Student Award, March 2010.

American Nuclear Society's Thesis Award, March 2010.

Air Force Institute of Technology's 2009 Non-Commissioned Officer of the Year.

STRYKER, AMIE

Best Paper at the 2010 Conference on Systems Engineering Research.

TOYDAS, MURAT

2010 Dean's Award, March 2010, for most exceptional master's thesis by a graduating student in the Department of Operational Sciences. Thesis: "Fuel Savings Opportunities from Air Refueling."

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 2010 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 98 questionnaires returned out of the 306 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	29% 64% 7% 0%
Average man-years of effort saved by the sponsors.	0.839
Average cost avoided per thesis/dissertation by the sponsors.	\$111,235
Total cost avoided for all theses and dissertations sponsored (estimated).	\$29.7M
Rank of respondents* Brig Gen (SES) Col (DR-IV/GS-15) Lt Col (DR-III/GS-14) Major (DR-II/GS-13)	4% 38% 47% 11%
*Of the 98 returned questionnaires, 15 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
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 FY10, 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)*	141	14	40	21	19	26	21
Refereed Publication Authorships	221	21	52	54	27	24	43
Refereed Conferences on the Basis of Full Paper Review	172	5	88	15	21	35	8
Refereed Conferences on the Basis of Abstract Review	240	2	49	59	22	17	91
Sponsor Funded Projects**	262	11	88	66	26	13	56
Books & Chapters of Books	14	-	8	-	1	2	3
Patents	1	-	1	-	-	-	-
Doctoral Dissertations Advised	32	1	13	10	1	3	4
Master's Theses Advised	235	4	63	31	24	64	52
Graduate Research Papers Advised	40	-	3	-	27	7	-

*FTE: Full-time equivalent

**Two projects associated with the Office of Research and Sponsored Programs (ENR) are reflected in Graduate School (EN) Total

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 86% of technical and 82% 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.

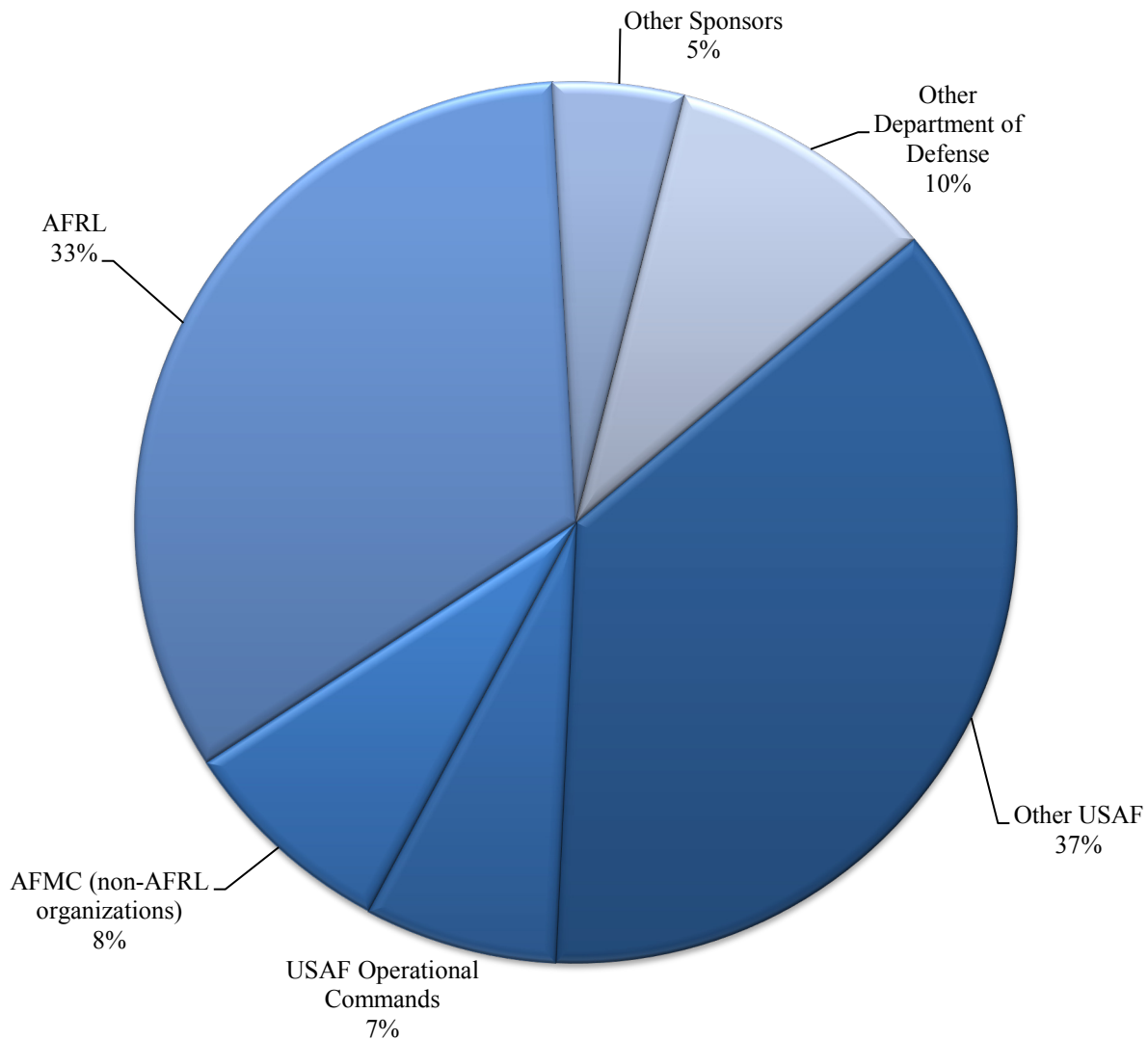


Figure 3.1: Sponsors of AFIT Theses, Dissertations, and Graduate Research Papers

Table 3.3: AFIT External Sponsorship by Organization

SPONSOR ORGANIZATION	PhD Dissertations	Master's Theses	Graduate Research Papers	Funded Projects
OFFICE OF THE SECRETARY OF THE AIR FORCE		1		5
HQ UNITED STATES AIR FORCE		4	1	
AIR COMBAT COMMAND			1	
National Air and Space Intelligence Center	2	8	2	19
AIR EDUCATION AND TRAINING COMMAND		1		1
AIR FORCE MATERIEL COMMAND	1	6	10	10
Aeronautical Systems Center	1	2	1	
Air Force Research Laboratory (AFRL)				
Air Force Office of Scientific Research (AFOSR)	6	13		36
Air Vehicles Directorate (RB)		13		21
Directed Energy Directorate (RD)	1	3		14
711 Human Performance Wing	1	8	1	4
Information Directorate (RI)	2	4		5
Materials & Manufacturing Directorate (RX)		9		15
Munitions Directorate (RW)		2		
Propulsion Directorate (RZ)	1	11		8
Sensors Directorate (RY)	6	20	2	32
Space Vehicles Directorate (RV)		2		7
Air Force Global Logistics Support Center		5		1
Air Force Test Pilot School		1		2
AIR FORCE SPECIAL OPERATIONS COMMAND		1		
AIR MOBILITY COMMAND		4	10	1
AIR FORCE SPACE COMMAND		11		
US AIR FORCE FIELD OPERATING AGENCIES				10
Air Force Technical Application Center	1	1		3
Other Field Operating Agencies		4	1	
OTHER DEPARTMENT OF DEFENSE		2	1	19
Defense Threat Reduction Agency	2	5		6
High Energy Laser Joint Technology Office	2	5		7
Joint Improvised Explosive Device Defeat Organization		1		
National Security Agency		3		8
Operationally Responsive Space Office	1	2		
Office of Secretary Defense				5
US Central Command		1		
US Strategic Command		1		2
US Transportation Command				1
United States Army		1		2
United States Marine Corps		2		
United States Navy		1		2
OTHER FEDERAL AGENCIES		1		
Department of Homeland Security	2	1		1
Environmental Protection Agency		1		
National Aeronautics and Space Administration		3		
National Science Foundation		1		4
NON-FEDERAL AGENCIES	1	7		6
Dayton Area Graduate Studies Institute				5
* TOTALS	30	169	33	262

*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 FY10, and Figure 3.2 summarizes the past ten fiscal years of outside sponsored funding.

Department	Newly Awarded Research Projects		Newly Awarded Education Projects		Total FY10 Newly Awarded Projects		Total FY10 Research Expenditures
	#	\$k	#	\$k	#	\$k	\$k
Mathematics & Statistics (ENC)	11	357	-	-	11	357	389
Electrical & Computer Eng (ENG)	85	4,807	3	475	88	5,282	10,323
Engineering Physics (ENP)	59	5,782	7	603	66	6,385	5,518
Research & Sponsored Programs (ENR)	1	6	1	29	2	35	35
Operational Sciences (ENS)	22	3,631	4	367	26	3,998	5,322
Systems and Eng Management (ENV)	10	1,247	3	590	13	1,837	1,520
Aeronautical & Astronautical Eng (ENY)	56	1,958	-	-	56	1,958	4,357
TOTAL	244	17,788	18	2,064	262	19,852	27,464

Center	#	\$k	#	\$k	#	\$k	\$k
Advanced Navigation Technology (ANT)	23	1,390	-	-	23	1,390	2,081
Center for Cyberspace Research (CCR)	18	1,160	2	471	20	1,631	3,315
Center for Directed Energy (CDE)	27	1,847	3	83	30	1,930	2,427
Center for MASINT Studies and Research (CMSR)	17	2,730	2	465	19	3,195	1,824
Center for Operational Analysis (COA)	26	3,726	6	557	32	4,283	5,438
Center for Systems Engineering (CSE)	2	620	-	-	2	620	437
TOTAL	113	11,473	13	1,576	126	13,049	15,522

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 in research expenditures column. All Center funds are also included in departmental funding.

Figure 3.2: New Award History FY01-FY10

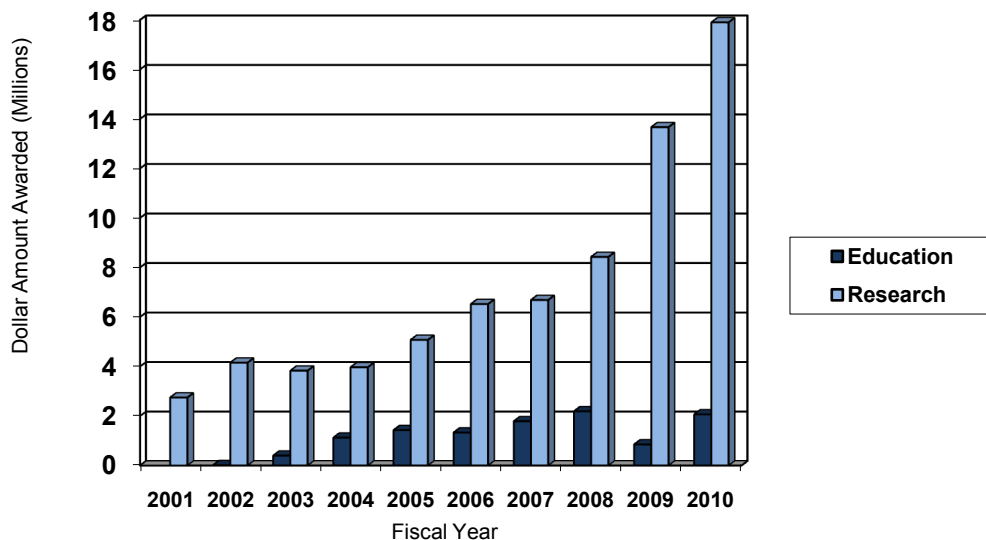
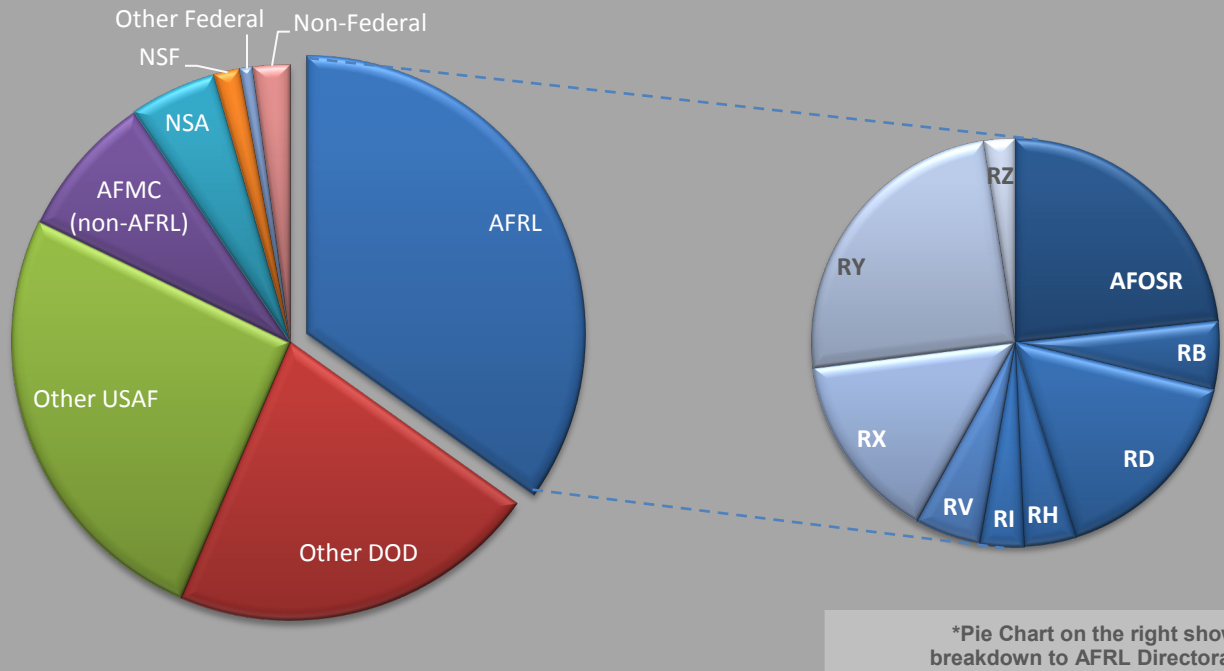


Figure 3.3 New FY10 Awards by Sponsor



*Pie Chart on the right shows breakdown to AFRL Directorate

Table 3.5 New FY10 Awards to Academic Departments & Research Centers by Sponsor

	AFRL	AFMC (non-AFRL)	Other USAF	NSA	Other DOD	NSF	Other Federal	Non- Federal	Total
Dept.	\$k	\$k	\$k	\$k	\$k	\$k	\$k	\$k	\$k
ENC	342	-	15	-	-	-	-	-	357
ENG	2,540	100	411	1,005	688	223	-	315	5,282
ENP	2,024	50	3,025	-	1,076	50	150	10	6,385
ENR	6	-	-	-	-	29	-	-	35
ENS	510	1,512	764	-	1,212	-	-	-	3,998
ENV	84	-	835	-	860	-	-	58	1,837
ENY	1,411	-	60	-	447	-	-	40	1,958
TOTAL	6,917	1,662	5,110	1,005	4,283	302	150	423	19,852
Research Center	\$k	\$k	\$k	\$k	\$k	\$k	\$k	\$k	\$k
ANT	648	100	25	-	305	-	-	312	1,390
CCR	408	-	111	837	52	223	-	-	1,631
CDE	1,291	50	93	-	436	50	-	10	1,930
CMSR	200	-	2,841	-	154	-	-	-	3,195
COA	590	1,512	778	-	1,403	-	-	-	4,283
CSE	-	-	-	-	600	-	-	20	620
TOTAL	3,137	1,662	3,848	837	2,950	273	-	342	13,049

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

BECK, MATTHEW C., *Downside Risk Optimization of the Thrift Savings Plan Lifecycle Fund Portfolios*. AFIT/GCA/ENV/10-M02. Faculty Advisor: Lt Col R. David Fass. Sponsor: SAF.

4.2. HEADQUARTERS UNITED STATES AIR FORCE

MASTER'S THESES

CARTER, REBECCA L., *Consolidation of MOBAGS: The Quest for Efficiency in Logistics Operations*. AFIT/IMO/ENS/10-02. Faculty Advisor: Dr. William A. Cunningham. Sponsor: HQ USAF/A4.

FLOSI, DAVID A., *An Exploratory Case Study of Program Development within the USAF Nuclear Enterprise*. AFIT/LSCM/ENS/10-03. Faculty Advisor: Dr. Jeffrey A. Ogden. Sponsor: HQ USAF/A4.

GEORGE, ANTHONY R., *Evaluation of Cost Improvement Models When Programs Experience Unplanned Production Decreases*. AFIT/GCA/ENV/10-M04. Faculty Advisor: Lt Col Eric J. Unger. Sponsor: HQ USAF/A9.

RIDDEL, KEVIN C., *An Analysis of Factors that Influence Air Force Civil Engineer Company Grade Officer Turnover Intentions*. AFIT/GEM/ENV/10-M10. Faculty Advisor: Lt Col Daniel T. Holt. Sponsor: HQ USAF/A7C.

GRADUATE RESEARCH PAPERS

PEREZ, DAVID D., *Cyberspace Dependence in Air Force Flying Squadrons and its Effect on Mission Assurance*. AFIT/ICW/ENG/10-04. Faculty Advisor: Dr. Robert F. Mills. Sponsor: HQ USAF/A30-CF.

4.3. AIR COMBAT COMMAND

GRADUATE RESEARCH PAPERS

DONAGHY, MICHAEL R., *Application of a Non-linear Program to the Establishment of a Hub and Spoke System in Africa*. AFIT/IMO/ENS/10-04. Faculty Advisor: Dr. James T. Moore. Sponsor: USAFE/A8Z.

NATIONAL AIR AND SPACE INTELLIGENCE CENTER

DOCTORAL DISSERTATIONS

BRADLEY, KENNETH C., *Midwave Infrared Imaging Fourier Transform Spectrometry of Combustion Plumes*. AFIT/DS/ENP/09-S01. Faculty Advisor: Dr. Glen P. Perram. Sponsor: NASIC.

LOEFFELHOLZ, BERNARD J., *Neural Extensions to Robust Parameter Design*. AFIT/DS/ENS/10-03. Faculty Advisor: Dr. Kenneth W. Bauer. Sponsor: NASIC.

MASTER'S THESES

ANDERSON, JOEL R., *Monocular Passive Ranging by an Optical System with Band Pass Filtering*. AFIT/GAP/ENP/10-M01. Faculty Advisor: Dr. Glen P. Perram. Sponsor: NASIC.

CALL, ROBERT W., *An Aerothermal Analysis of a Hypersonic Glide Vehicle*. AFIT/GA/ENY/10-M03. Faculty Advisor: Dr. Robert Greendyke. Sponsor: NASIC.

HAWKER, TRAVIS J., *Cyberspace Mission Focus: NW Ops vs. NetOps*. AFIT/ICW/ENG/10-03. Faculty Advisor: Dr. Robert F. Mills. Sponsor: NASIC.

HIRSCHFELD, MITCHELL D.I., *An Application of Automated Theorem Provers To Computer System Security: The Schematic Protection Model*. AFIT/GCO/ENG/10-18. Faculty Advisor: Dr. Rusty Baldwin. Sponsor: NASIC.

MACDONALD, DOUGLAS J., *Passive Ranging Using Infra-Red Atmospheric Attenuation*. AFIT/GAP/ENP/10-M09. Faculty Advisor: Lt Col Michael R. Hawks. Sponsor: NASIC.

McGOWAN, JOHN E., *The Effect of Synthetic Aperture Radar Image Resolution on Target Discrimination*. AFIT/GE/ENG/10-18. Faculty Advisor: Dr. Andrew J. Terzuoli. Sponsor: AFRL/RV & NASIC.

PASSEY, ANDREW J., *Modeling the Effects of Information Operations on Integrated Air Defense Systems*. AFIT/OR/MS/ENS/10-10. Faculty Advisor: Dr. John O. Miller. Sponsor: NASIC.

YOUNG, ANTHONY M., *Scene Change Artifacts In Fourier Transform Spectroscopy Of Temporally Changing Sources*. AFIT/GAP/ENP/10-M16. Faculty Advisor: Dr. Kevin C. Gross. Sponsor: NASIC.

GRADUATE RESEARCH PAPERS

SETTLE, JASON R., *Blue Survivability Against a Command Guided Air-to-Air Missile*. AFIT/IOA/ENS/Y09-05. Faculty Advisor: Dr. John O. Miller. Sponsor: NASIC.

SMITH, ADAM R., *Blue Survivability Against a Command Guided Air-to-Air Missile*. AFIT/IOA/ENS/Y09-06. Faculty Advisor: Dr. John O. Miller. Sponsor: NASIC.

4.4. AIR EDUCATION AND TRAINING COMMAND

AIR UNIVERSITY

MASTER'S THESES

BELL, BRYAN M., *Assuring GPS Capabilities Under a Contested Space Environment: An Implementation Plan*. AFIT/GSS/ENY/10-M-01. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: SPAATZ/ARS.

AIR FORCE INSTITUTE OF TECHNOLOGY

DOCTORAL DISSERTATIONS

BORDNER, RALPH E., III, *Orbital Tori Construction Using Trajectory Following Spectral Methods*. AFIT/DS/ENY/10-09. Faculty Advisor: Dr. William E. Wiesel. Sponsor: N/A.

LACEY, TIMOTHY H., *Reputation-Based Internet Protocol Security: A Multilayer Security Framework for Mobile Ad Hoc Networks*. AFIT/DCS/ENG/10-07. Faculty Advisor: Dr. Robert F. Mills. Sponsor: N/A.

MILLS, DAVID T., *Consistency Properties for Growth Model Parameters Under an Infill Asymptotics Domain*. AFIT/DAM/ENC/10-1. Faculty Advisor: Dr. Edward D. White. Sponsor: N/A.

YAMAMOTO, DIRK P., *Providing a Theoretical Basis for Nanotoxicity Risk Analysis Departing from Traditional Physiologically-Based Pharmacokinetic (PBPK) Modeling*. AFIT/DS/ENV/10-S01. Faculty Advisor: Dr. Michael L. Shelley. Sponsor: N/A.

MASTER'S THESES

- ARMSTRONG, ANDREW M., *A Security Assessment of Modern Smart Cards under Differential Power Analysis Attacks Using a Field Programmable Gate Way Implementation of a Side Channel Analysis Test Platform*. AFIT/GCE/ENG/10-01. Faculty Advisor: Lt Col Jeffrey Humphries. Sponsor: N/A.
- BARKER, DANIEL A., *Validation of a Concept Assessment Framework*. AFIT/GRD/ENV/10M-01. Faculty Advisor: Dr. David R. Jacques. Sponsor: N/A.
- BISHER, CHRISTIAN L., *Verification of KAM Theory on Earth Orbiting Satellites*. AFIT/GAE/ENY/10-M03. Faculty Advisor: Dr. William E. Wiesel Jr. Sponsor: N/A.
- BOOK, TODD A., *Design Analysis of a Space Based Chromotomographic Hyperspectral Imaging Experiment*. AFIT/GA/ENY/10-M01. Faculty Advisor: Dr. Jonathan T. Black. Sponsor: N/A.
- BROOKS, EVAN M., *Estimating Characteristics of a Maneuvering Reentry Vehicle Observed by Multiple Sensors*. AFIT/GA/ENY/10-M02. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: N/A.
- CANCINO, PAUL A., *Comparison of War Readiness Engine Repair Network Integration Metrics for the B-1B Lancer F-101-GE-102 Engine*. AFIT/LSCM/ENS/10-01. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: N/A.
- CARDOSO, FABIO A., *Stealthy River Navigation in Jungle Combat Conditions*. AFIT/LSCM/ENS/10-02. Faculty Advisor: Dr. Alan W. Johnson. Sponsor: N/A.
- CLAGNAZ, JOHN J., *U. S. Cyber Command – Cyberspace Superiority in the 21st Century*. AFIT/GCO/ENG/10-05. Faculty Advisor: Dr. Robert F. Mills. Sponsor: N/A.
- COBB, CHRISTOPHER J. and GALLEGOS, DAMIAN J., *An Analysis of the Efficacy and Effectiveness of Live-Virtual-Constructive Capabilities in the Joint Environment for Testing and Training*. AFIT/GSE/ENV/10-J01DL. Faculty Advisor: Dr. John M. Colombi. Sponsor: N/A.
- COLON, CARLOS J., *Assessing the Economic and Environmental Impacts Associated with Current Street Lighting Technologies*. AFIT/GEM/ENV/10-M01. Faculty Advisor: Dr. Alfred E. Thal. Sponsor: N/A.
- COY, DAVID F., *Changes to Electrical Conductivity in Irradiated Carbon-Nickel Nanocomposites*. AFIT/GNE/ENP/10M-02. Faculty Advisor: Dr. James C. Petrosky. Sponsor: N/A.
- CSOMA, ERNEST, *Defining the Technology Transition Manager within the Acquisition Framework of the Department of Defense*. AFIT/GRD/ENV/10-M02. Faculty Advisor: Dr. Alfred E. Thal. Sponsor: N/A.
- DAVIS, LEVI N., *Personality Measures as Predictors of Long-Term Employment in Air Force Officers*. AFIT/GEM/ENV/10-M02. Faculty Advisor: Lt Col Daniel T. Holt. Sponsor: N/A.
- DEAS, BRIAN T., *Pulse Shape Correlation for Laser Detection and Ranging (LADAR)*. AFIT/GE/ENG/10-07. Faculty Advisor: Dr. Stephen Cain. Sponsor: N/A.
- DELL'ACCIO, PETER J., *Visually Managing IPsec*. AFIT/GCO/ENG/10-06. Faculty Advisor: Lt Col Stuart H. Kurkowski. Sponsor: N/A.
- DIRIK, NECIP, *Maximizing Strike Planning Efficiency for a Given Class of Targets*. AFIT/OR/MS/ENS/10-01. Faculty Advisor: Dr. James T. Moore. Sponsor: N/A.
- EASTON, RYAN M., *Using the "Compatibility Assessment Method" to Determine Subsystem Feasibility on Predator UAS*. AFIT/GRD/ENV/10-J01. Faculty Advisor: Lt Col David S. Long. Sponsor: N/A.

ELTON, BENJAMIN O., *Mechanical Properties Characterization and Business Case Analysis of the Fiber Metal Laminate GLARE-3 for Use as Secondary Aircraft Structure*. AFIT/GRD/ENV/10M-05. Faculty Advisor: Dr. Alfred E. Thal. Sponsor: N/A.

FRANCIK, PETER R., *Analysis of a Rumor Routing Protocol with Limited Packet Lifetimes*. AFIT/GE/ENG/10-09. Faculty Advisor: Dr. Rusty O. Baldwin. Sponsor: N/A.

FRITTS, NICHOLAS E., *A Distributed Network Logging Topology*. AFIT/GCO/ENG/10-07. Faculty Advisor: Lt Col Brett Borghetti. Sponsor: N/A.

GALLEGOS, DAMIAN J., See COBB, CHRISTOPHER J.

GARZA, RICARDO A., *A Simulation Based Methodology to Examine the B-1B's AN/ALQ-161 Maintenance Process*. AFIT/LSCM/ENS/10-04. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: N/A.

GHEESLING, RUSSELL H., *A Study of Formal and Informal Mentoring in the United States Air Force*. AFIT/GEM/ENV/10-M03. Faculty Advisor: Lt Col Daniel T. Holt. Sponsor: N/A.

GRADDY, MARCELLO T., *Using Decision Analysis To Select Facility Maintenance Management Information Systems*. AFIT/GEM/ENV/10M-04. Faculty Advisor: Dr. Alfred E. Thal. Sponsor: N/A.

GRAFF, MICHAEL E., *Development of a Remotely Operated Autonomous Satellite Tracking System*. AFIT/GSS/ENV/10-M03. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: N/A.

GRIGSBY, DAVID A., *Satellite Capabilities Mapping-Utilizing Small Satellites*. AFIT/GSE/ENV/10-S01DL. Faculty Advisor: Dr. Jonathan A. Black. Sponsor: N/A.

HA, TAEGYUN, *The UAV Continuous Coverage Problem*. AFIT/OR/MS/ENS/10-03. Faculty Advisor: Dr. Youcef Kebir. Sponsor: N/A.

HALL, TIMOTHY S., *Orbit Maneuver for Responsive Coverage Using Electric Propulsion*. AFIT/GSS/ENV/10-M04. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: N/A.

HINSON, JOSEPH M., *Code White: A Signed Code Protection Mechanism for Smartphones*. AFIT/GCO/ENG/10-10. Faculty Advisor: Dr. Rusty Baldwin. Sponsor: N/A.

HOGAN, MICHAEL S. and PESCATORE, MELISSA L., *Timely Implementation of a Tasking, Processing, Exploitation, and Dissemination Ground Architecture in an Operationally Responsive Space Environment*. AFIT/GSE/ENV/10-J03DL. Faculty Advisor: Dr. Bradley J. Ayres. Sponsor: N/A.

HUBER, DEREK J., *Attaining Realistic Simulations of Mobile Ad-hoc NETWORKS*. AFIT/GCO/ENG/10-11. Faculty Advisor: Maj Mark D. Silvius. Sponsor: N/A.

HUGHES, ROBINSON C.L., *Development of a Concept Maturity Assessment Framework*. AFIT/GRD/ENV/10-M05. Faculty Advisor: Dr. David R. Jacques. Sponsor: N/A.

JEE, SOO-CHAN, *Development of Morphing Aircraft Using SMP*. AFIT/GSE/ENV/10-M02. Faculty Advisor: Dr. Som Soni. Sponsor: N/A.

JOHNSTON, ROSS T., *Understanding the Effectiveness of Performance Management Practices*. AFIT/GRD/ENV/10-M07. Faculty Advisor: Lt Col Joseph R. Wirthlin. Sponsor: N/A.

KIM, CHANG-SUNG, *Measuring the Effect of Transportation Uncertainty in the Postponement Strategy*. AFIT/LSCM/ENS/10-05. Faculty Advisor: Lt Col Doral Sandlin. Sponsor: N/A.

KIM, DAEWON, *Korean Domestic Third Party Logistics Providers: Research for a Global Market*. AFIT/LSCM/ENS/10-06. Faculty Advisor: Dr. William Cunningham. Sponsor: N/A.

KWAK, HYON H., *Toward A Mobile Agent Relay Network*. AFIT/GCS/ENG/10-04. Faculty Advisor: Lt Col Brett Borghetti. Sponsor: N/A.

LEE, BENJAMIN, *An Empirical Study of Re-sampling Techniques as a Method for Improving Error Estimates in Split-plot Designs*. AFIT/OR/MS/ENS/10-06. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: N/A.

LYNN, JESSE L., *Heat and Current Propagation in Buggered Super-Conducting and Hyper-Conducting Wire*. AFIT/GAM/ENC/09-02. Faculty Advisor: Lt Col Kyle A. Novak. Sponsor: N/A.

McCARTY, JUDSON E., *A Simulink Based Tool for Design Reference Mission Modeling*. AFIT/GSE/ENV/10-S02DL. Faculty Advisor: Dr. Richard Cobb. Sponsor: N/A.

MILLER, STEVEN D., *Investigation of a Novel Compact Vibration Isolation System for Space Applications*. AFIT/GA/ENY/10-M07. Faculty Advisor: Lt Col Eric D. Swenson. Sponsor: N/A.

MONTOYA, GABRIEL ALEJANDRO, *Assessing Resilience in Power Grids as a Particular Case of Supply Chain Management*. AFIT/LSCM/ENS/10-08. Faculty Advisor: Maj Daniel Mattioda. Sponsor: N/A.

MORIAS, JOSE M., *Emergency Management Benchmarking Study: Lessons for Increasing Supply Chain Resilience*. AFIT/LSCM/ENS/10-09. Faculty Advisor: Lt Col Timothy A. Pettit. Sponsor: N/A.

MORSE, ARTHUR L., *Preliminary Electrical Designs for CTE_x and AFIT Satellite Ground Station*. AFIT/GA/ENY/10-M08. Faculty Advisor: Dr. Jonathan T. Black. Sponsor: N/A.

NAGY, KRISTOPHER C., *An Analysis of the Elements of Collaboration Associated with Top Collaborative Tools*. AFIT/GIR/ENV/10-M01. Faculty Advisor: Lt Col Jason M. Turner. Sponsor: N/A.

O'DELL, DANIEL C., *Development and Demonstration of a Field-Deployable Fast Chromotomographic Imager*. AFIT/GEO/ENP/10-M01. Faculty Advisor: Lt Col Michael R. Hawks. Sponsor: N/A.

OYAMA, KYLE F., *A Structured Analysis to Link Modularity to System Assembly and Checkout*. AFIT/GRD/ENV/10-M09. Faculty Advisor: Dr. David R. Jacques. Sponsor: N/A.

PAULSON, ANTHONY B., *Generational Differences in Knowledge Markets*. AFIT/GRD/ENV/10-M10. Faculty Advisor: Lt Col Jason M. Turner. Sponsor: N/A.

PESCATORE, MELISSA L., See HOGAN, MICHAEL S.

PLATT, SETH D., *The Development of a Leadership Self-Efficacy Measure*. AFIT/GEM/ENV/10-M07. Faculty Advisor: Lt Col Alexander J. Barelka. Sponsor: N/A.

POULTON, JOSHUA M., *A Study of the Relationship Between Proenvironmental Product Use and Environmnetal Concern*. AFIT/GEM/ENV/10-M09. Faculty Advisor: Dr. Alfred E. Thal. Sponsor: N/A.

PUGH, STEVEN M., *Investigating the Use of Frequency Selective Surfaces in High Power Microwave Applications*. AFIT/GE/ENG/10-25. Faculty Advisor: Dr. Michael J. Havrilla. Sponsor: N/A.

SABATOWSKI, PETER A., *Security Vulnerability Trends Related to Electric Power Supplied at Military Installations*. AFIT/GEM/ENV/10-M11. Faculty Advisor: Dr. Alfred E. Thal. Sponsor: N/A.

SCANLAN, JOHN H., IV., *Assessing the Alignment of Information Security with Strategic Business, and Strategic Information System Planning: A Department of Defense Perspective*. AFIT/GIR/ENV/10-J02. Faculty Advisor: Dr. Michael Grimaia. Sponsor: N/A.

SCHULER, WESLEY A., *Nuclear Forensics: Measurements of Uranium Oxides Using Time-of-Flight Secondary Ion Mass Spectrometry (TOF-SIMS)*. AFIT/GWM/ENP/10-M03. Faculty Advisor: Dr. Larry W. Burggraf. Sponsor: N/A.

SNYDER, JOHN M., *Improving Low Order, Linear, Positive Spatial Quadratures for the Partial Current Neutron Transport Method*. AFIT/GNE/ENP/10M-08. Faculty Advisor: Dr. Kirk A. Mathews. Sponsor: N/A.

SPANBAUER, BRIAN W. and YATES, JESSE M., *Geostationary Orbit Development and Evaluation for Space Situational Awareness*. AFIT/GSE/ENV/09-05DL. Faculty Advisor: Dr. Jonathan T. Black. Sponsor: N/A.

SPIDELL, MATTHEW T., *High Speed Thermal, Radius, and Emissivity Measurements of Ammonia Nitrate Detonation Fireballs*. AFIT/GAP/ENP/10-M14. Faculty Advisor: Dr. Kevin C. Gross. Sponsor: N/A.

STARR, WILLIAM J., JR., *Analysis of Slewing and Attitude Determination Requirements for CTEx*. AFIT/GSS/ENY/10-M05. Faculty Advisor: Dr. Jonathan T. Black. Sponsor: N/A.

STEWART, KYLE E., *Designing a Hybrid Virtualization Platform Design for Cyber Warfare and Simulation*. AFIT/GCE/ENG/10-06. Faculty Advisor: Lt Col Jeffrey W. Humphries. Sponsor: N/A.

SWENSON, PHILIP H., *Development and Design of an AFIT CubeSat Demonstrating Deployable Technology*. AFIT/GAE/ENY/10-M09. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: N/A.

THOMAS, GRANT M., *Prototype Development and Dynamic Characterization of Deployable CubeSat Booms*. AFIT/GA/ENY/10-M10. Faculty Advisor: Dr. Jonathan T. Black. Sponsor: N/A.

THORN, CAITLIN R., *Off-Design Analysis of a High Bypass Turbofan Using a Pulsed Detonation Combustor*. AFIT/GAE/ENY/10-M26. Faculty Advisor: Dr. Paul I. King. Sponsor: N/A.

THURRELL, REBECCA, *The Development of a Tactical-Level Full Range Leadership Measurement Instrument*. AFIT/GEM/ENV/10-M12. Faculty Advisor: Lt Col Alexander J. Barelka. Sponsor: N/A.

TOBEY, URIAH J., *Mission Analysis for Multiple Rendezvous of Near-Earth Asteroids Using Earth Gravity Assist*. AFIT/GA/ENY/10-M11. Faculty Advisor: Dr. William E. Wiesel Jr. Sponsor: N/A.

TOYDAS, MURAT, *Fuel Savings Opportunities from Air Refueling*. AFIT/LSCM/ENS/10-12. Faculty Advisor: Dr. Alan W. Johnson. Sponsor: N/A.

TRAN, KHOI D., *Uncertainty Quantification of Multi-Component Isotope-Separation Cascade Model*. AFIT/GNE/ENP/10-M09. Faculty Advisor: Dr. Kirk A. Mathews. Sponsor: N/A.

WARD, GREGORY J., *Knowledge Transformation in the United States Air Force Civil Engineer Career Field: A System Dynamics Approach*. AFIT/GEM/ENV/10-M13. Faculty Advisor: Dr. Michael L. Shelley. Sponsor: N/A.

WEISSGERBER, KURT, *Developing an Effective and Efficient Real Time Strategy Agent for Use as a Computer Generated Force*. AFIT/GCS/ENG/10-07. Faculty Advisor: Lt Col Brett Borghetti. Sponsor: N/A.

WOJTOWICZ, JOHN A., *Process for Concept Assessment and Maturation*. AFIT/GSE/ENV/10-J01DL. Faculty Advisor: Dr. David R. Jacques. Sponsor: N/A.

YAPLE, DANIELLE E., *Simulation and Application of GPOPS for Trajectory Optimization and Mission Planning Tool*. AFIT/GAE/ENY/10-M29. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: N/A.

YATES, DON J., *Monocular Vision Localization Using A Gimbaled Laser Range Sensor*. AFIT/GE/ENG/10-31. Faculty Advisor: Lt Col Michael J. Veth. Sponsor: N/A.

YATES, JESSE M., See SPANBAUER, BRIAN W.

YAVUZ, MURAT, *Optimizing an F-16 Squadron Weekly Pilot Schedule for the Turkish Air Force*. AFIT/OR/MS/ENS/10-11. Faculty Advisor: Dr. James T. Moore. Sponsor: N/A.

GRADUATE RESEARCH PAPERS

BEACH, MATTHEW G., *Managing Cyber Operator Training Curriculum*. AFIT/ICW/ENG/10-01. Faculty Advisor: Dr. Robert F. Mills. Sponsor: N/A.

DUPIS, PAUL L., *Leading Edge Systems; Integrating ALIS with ECSS*. AFIT/ILS/ENS/10-02. Faculty Advisor: Maj Daniel D. Mattioda. Sponsor: N/A.

FRIEDEL, JESSE J., *An Aggregate Assessment of Newer Technology G Suits*. AFIT/IOA/ENS/10-02. Faculty Advisor: Lt Col Stephen P. Chambal. Sponsor: N/A.

STUART, TIMOTHY J., *Coronet vs. Cargo: A Study into Increasing the Usage of Tanker Assets for Cargo Movement on Coronet Positioning and De-Positioning Legs*. AFIT/IMO/ENS/10-13. Faculty Advisor: Dr. James T. Moore. Sponsor: N/A.

4.5. AIR FORCE MATERIEL COMMAND

MASTER'S THESES

ARCHAMBAULT-MILINER, RYAN R., *An Evaluation of Compressed Work Schedules and Their Impact on Electricity Use*. AFIT/GCA/ENV/10-M01. Faculty Advisor: Lt Col Eric J. Unger. Sponsor: HQ AFMC.

FRY, FREDERICK G., *Optimizing Aircraft Availability: Where to Spend Your Next O&M Dollar*. AFIT/GCA/ENV/10-M03. Faculty Advisor: Lt Col Eric J. Unger. Sponsor: HQ AFMC/A4.

HAINGE, ASHTON D., *Validation of a Novel Approach to Solving Multibody Systems Using Hamilton's Weak Principle*. AFIT/GAE/ENV/10-M10. Faculty Advisor: Dr. Donald L. Kunz. Sponsor: HQ AFMC.

GRADUATE RESEARCH PAPERS

FORINO, JOHN T., *Examining Benefits of Dedicated Funding and Process Improvement for Depot Level Technology Insertion*. AFIT/ILS/ENS/10-03. Faculty Advisor: Lt Col Timothy A. Pettit. Sponsor: HQ AFMC/A4.

LEVIEN, ANDREW J., *Restructuring Depot Maintenance Occupational Series to Improve Flexibility*. AFIT/ILS/ENS/10J-03. Faculty Advisor: Lt Col Timothy A. Pettit. Sponsor: HQ AFMC/A4.

RITZEL, SCOTT M., *Depot Maintenance Transformation: Successful Strategies in Capital Investing*. AFIT/IDE/ENS/10J-04. Faculty Advisor: Lt Col Timothy A. Pettit. Sponsor: HQ AFMC/A4.

46th TEST WING

DOCTORAL DISSERTATIONS

McGUIRK, JEFFREY S., *Electromagnetic Field Control and Optimization Using Metamaterials*. AFIT/DEE/ENG/09-13. Faculty Advisor: Dr. Peter J. Collins. Sponsor: National RCS Test Facility.

MASTER'S THESES

SCHNEIDER, MATTHEW T., *Dive Angle Sensitivity Analysis for Flight Test Safety and Efficiency*. AFIT/GAE/ENY/10-M20. Faculty Advisor: Lt Col Richard Huffman. Sponsor: 40 FLTS/CC.

GRADUATE RESEARCH PAPERS

HENNINGER, TODD A., *Characterization of Ballistic Impact Flash: An Initial Investigation and Methods Development*. AFIT/IOA/ENS/10-4. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: 46 TG/OL-AC.

350th ELECTRONIC SYSTEMS WING

GRADUATE RESEARCH PAPERS

CASEY, BRENDAN K., *Policy Changes for Acquisition of Offensive Cyber Systems*. AFIT/ICW/ENG 10-02. Faculty Advisor: Dr. Robert F. Mills. Sponsor: 950 ELSG/NW.

GLEN, MATTHEW G. and IVENER, TODD A., *An Engineering Baseline Evaluation and Service-Oriented Analysis of Air Mission Management Application Alternatives*. AFIT/ISE/ENV/10-J03. Faculty Advisor: Dr. John M. Colombi. Sponsor: 350 ELSG/CC.

IVENER, TODD A., See GLEN, MATTHEW G.

478th AERONAUTICAL SYSTEMS WING

GRADUATE RESEARCH PAPERS

DROWN, DARON J. and GRAHAM, SETH W., *Core Logistics Capability Policy Applied to USAF Combat Aircraft Avionics Software: A Systems Engineering Analysis*. AFIT/ISE/ENV/10-J02. Faculty Advisor: Col David S. Long. Sponsor: 478 AESG/EN.

GRAHAM, SETH W., See DROWN, DARON J.

JONES, ROBERT B., *3D Laser Imaging and Computer Modeling of the MQ-9 Reaper Remotely Piloted Aircraft*. AFIT/GAE/ENY/10-M13. Faculty Advisor: Lt Col Christopher M. Shearer. Sponsor: 478 AESG/SYE.

AERONAUTICAL SYSTEMS CENTER

DOCTORAL DISSERTATIONS

HODSON, DOUGLAS D., *Performance Analysis of Live-Virtual-Constructive and Distributed Virtual Simulations: Defining Requirements in Terms of Temporal Consistency*. AFIT/DCE/ENG/09-25. Faculty Advisor: Dr. Rusty Baldwin. Sponsor: ASC/XRA-SIMAF.

MASTER'S THESES

MEIER, DAVID C., *Application of Satellite-Derived Wind Profiles to Joint Precision Airdrop System (JPADS) Operations*. AFIT/GAP/ENP/10-M10. Faculty Advisor: Dr. Steven T. Fiorino. Sponsor: Det 3, 16 WS & 516 AESW.

WEBER, ERIC S., *Rated Force Management Metrics: KC-10 Case Study*. AFIT/IMO/ENS/10-17. Faculty Advisor: Maj Daniel D. Mattioda. Sponsor: ASC.

GRADUATE RESEARCH PAPERS

MILLS, JASON T., *DSCA: General Population Evacuation of Texas and Louisiana*. AFIT/IMO/ENS/10-08. Faculty Advisor: Dr. William A. Cunningham. Sponsor: ASC/QI.

AFRL: AIR FORCE OFFICE OF SCIENTIFIC RESEARCH

DOCTORAL DISSERTATIONS

BARGER, LUKE A., *The Scattering Matrix Elements of the Nonadiabatic Collision*. AFIT/DS/ENP/10-S02. Faculty Advisor: Dr. David Weeks. Sponsor: AFOSR.

HALE, CHAD S., *Consideration of Wear Rates at High Velocity*. AFIT/DS/ENY/10-08. Faculty Advisor: Dr. Anthony N. Palazotto. Sponsor: AFOSR.

HYDE, MILO W., IV, *Determining the Index of Refraction of an Unknown Object Using Passive Polarimetric Imagery Degraded by Atmospheric Turbulence*. AFIT/DEE/ENG/10-12. Faculty Advisor: Maj Jason D. Schmidt. Sponsor: AFOSR.

McMAHON, JASON R., *Improving Range Estimation of a 3D FLASH LADAR via Blind Deconvolution*. AFIT/DEE/ENG/10-13. Faculty Advisor: Dr. Richard K. Martin. Sponsor: AFOSR.

SCHUMER, EVELYN A., *Improved Modeling of Midlatitude D-region Ionospheric Absorption of High Frequency Radio Signals during Solar X-ray Flares*. AFIT/DS/ENP/09-J01. Faculty Advisor: Dr. William Bailey. Sponsor: AFOSR.

WILLIAMS, CHRISTOPHER S., *Three Dimensional Positron Annihilation Momentum Measurement Technique (3DPAMM) Applied to Measure Oxygen-Atom Defects in 6H Silicon Carbide*. AFIT/DS/ENP/10-M02. Faculty Advisor: Dr. Larry W. Burggraf. Sponsor: AFOSR, DTRA & DHS.

MASTER'S THESES

BERGSTROM, AUSTIN C., *Optical and Electrical Characterization of Bulk Grown Indium-Gallium-Arsenide Alloys*. AFIT/GAP/ENP/10-M02. Faculty Advisor: Dr. Yung Kee Yeo. Sponsor: AFOSR.

CADY, CAMDON R., *Static and Dynamic Component Obfuscation on Reconfigurable Devices*. AFIT/GE/ENG/10-06. Faculty Advisor: Dr. Yong C. Kim. Sponsor: AFOSR.

DIEDRICK, BRADLEY K., *Effects of Prior Aging at 260 °C in Argon on Inelastic Deformation Behavior of PMR-15 Polymer at 260 °C: Experiment and Modeling*. AFIT/GAE/ENY/10-M08. Faculty Advisor: Dr. Marina B. Ruggles-Wrenn. Sponsor: AFOSR.

DRENTH, AARON C., *Laser-Included Fluorescence and Synthetic Jet Fuel Analysis in the Ultra Compact Combustor*. AFIT/GAE/ENY/09-D03. Faculty Advisor: Lt Col Richard D. Branam. Sponsor: AFOSR.

ERSKINE, JOSEPH R., *Developing Cyberspace Data Understanding: Using CRISP-DM for Host-based IDS Feature Mining*. AFIT/GCS/ENG/10-01. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: AFOSR.

KORANEK, DANIEL F., *Deterministic, Efficient Variation of Circuit Components to Improve Resistance to Reverse Engineering*. AFIT/GCO/ENG/10-15. Faculty Advisor: Dr. Yong C. Kim. Sponsor: AFOSR.

MAGREE, DANIEL P., *A Photogrammetry-Based Hybrid System for Dynamic Tracking and Measurement*. AFIT/GAE/ENY/10-J01. Faculty Advisor: Dr. Jonathan T. Black. Sponsor: AFOSR.

MEADOR, STEPHEN P., *Consideration of Wear Rates at High Velocities*. AFIT/GAE/ENY/10-M16. Faculty Advisor: Dr. Anthony N. Palazotto. Sponsor: AFOSR.

PARHAM, JAMES D., *Component Hiding Using Identification and Boundary Blurring Techniques*. AFIT/GE/ENG/10-22. Faculty Advisor: Lt Col Jeffrey T. McDonald. Sponsor: AFOSR.

PELLIZZARI, CASEY J., *Phase Unwrapping in the Presence of Strong Turbulence*. AFIT/GE/ENG/10-23. Faculty Advisor: Maj Jason D. Schmidt. Sponsor: AFOSR.

ROWELL, CHARLES R., JR., *Modeling Computer Communication Networks in a Realistic 3D Environment*. AFIT/GCE/ENG/10-05. Faculty Advisor: Lt Col Stuart H. Kurkowski. Sponsor: AFOSR.

SLAMAN, DANIEL R., *Side Channel Analysis Countermeasures via Obfuscated Bytecode Instruction Sets*. AFIT/GE/ENG/10-27. Faculty Advisor: Dr. Yong C. Kim. Sponsor: AFOSR.

THOMAS, LEVI M., *Flow Measurements Using Particle Image Velocimetry in the Ultra Compact Combustor*. AFIT/GAE/ENY/09-D04. Faculty Advisor: Lt Col Richard D. Branam. Sponsor: AFOSR.

AFRL: AIR VEHICLES DIRECTORATE

MASTER'S THESES

BARRETT, JEFFREY A., *Development of a Flapping Wing Design Incorporating Shape Memory Alloy Actuation*. AFIT/GAE/ENY/10-M02. Faculty Advisor: Dr. Jonathan T. Black. Sponsor: AFRL/RB.

BOSTON, JONATHAN T., *Experiments with Geometric Non-Linear Coupling for Analytical Validation*. AFIT/GAE/ENY/10-M04. Faculty Advisor: Lt Col Eric D. Swenson. Sponsor: AFRL/RB.

BUGAJSKI, GABRIEL T., *Architectural Considerations for Single Operator Management of Multiple Unmanned Aerial Vehicles*. AFIT/GSE/ENV/10-M03. Faculty Advisor: Dr. John M. Colombi. Sponsor: AFRL/RB.

LEMKE, AARON M., *Part Count: Monolithic Part Effects On Manufacturing Labor Cost, An Aircraft Applied Model*. AFIT/GFA/ENV/10-M02. Faculty Advisor: Dr. Som Soni. Sponsor: AFRL/RB.

LOVE, BRIAN T., *Particle Size Control for PIV Seeding Using Dry Ice*. AFIT/GAE/ENY/10-M15. Faculty Advisor: Dr. Mark F. Reeder. Sponsor: AFRL/RB.

SABAT, JOSEPH W., JR., *Structural Response of Slotted Waveguide Antenna Stiffened Structure Components Under Compression*. AFIT/GAE/ENY/10-M19. Faculty Advisor: Dr. Anthony N. Palazotto. Sponsor: AFRL/RB.

SEIBERT, MATTHEW T., STRYKER, ANDREW J., WARD, JILL R., and WELLBAUM, CHRIS T., *System Analysis and Prototyping For Single Operator Management of Multiple Unmanned Aerial Vehicles Operating Beyond Line of Sight*. AFIT/GSE/ENV/10-M01. Faculty Advisor: Dr. David R. Jacques. Sponsor: AFRL/RB.

SIMS, TRAVIS W., *A Structural Dynamic Analysis of a Manduca Sexta Forewing*. AFIT/GAE/ENY/10-M22. Faculty Advisor: Dr. Anthony N. Palazotto. Sponsor: AFRL/RB.

STRYKER, ANDREW J., See SIEBERT, MATTHEW T.

SWITZER, BENJAMIN P., *CFD Analysis of Experimental Wing and Winglet for FalconLAUNCH 8 and the ExFiT Program*. AFIT/GAE/ENY/10-M25. Faculty Advisor: Lt Col Ronald J. Simmons. Sponsor: AFRL/RB.

VINACCO, MICHAEL J., *ExFiT Flight Design and Structural Modeling for FalconLAUNCH VIII Sounding Rocket*. AFIT/GAE/ENY/10-M27. Faculty Advisor: Dr. Jonathan T. Black. Sponsor: AFRL/RB.

WARD, JILL R., See SIEBERT, MATTHEW T.

WELLBAUM, CHRIS T., See SIEBERT, MATTHEW T.

AFRL: DIRECTED ENERGY DIRECTORATE

DOCTORAL DISSERTATIONS

DIXON, DONALD B., *Statistical Image Recovery From Laser Speckle Patterns With Polarization Diversity*. AFIT/DEO/ENG/10-11. Faculty Advisor: Dr. Stephen C. Cain. Sponsor: AFRL/RD.

MASTER'S THESES

CHESTERMAN, MICHAEL C., *Collateral Damage Effects of Directed Energy Weapons*. AFIT/GAE/ENY/10-M05. Faculty Advisor: Lt Col Richard E. Huffman. Sponsor: AFRL/RD.

DANIEL, JOSHUA D., *The Combined Effects of Radio Frequency and Gamma Irradiation on P-Channel MOSFETs*. AFIT/GNE/ENP/10-S01. Faculty Advisor: Dr. James C. Petrosky. Sponsor: AFRL/RD.

ESTEP, NICHOLAS A., *High Power Microwave (HPM) and Ionizing Radiation Effects on CMOS Devices*. AFIT/GE/ENG/10-08. Faculty Advisor: Dr. Andrew J. Terzuoli. Sponsor: AFRL/RD.

AFRL: 711th HUMAN PERFORMANCE WING/RH

DOCTORAL DISSERTATIONS

HARDMAN, NICHOLAS S., *An Empirical Methodology for Engineering Human Subjects Integration*. AFIT/DS/ENV/09-D01. Faculty Advisor: Dr. John M. Colombi. Sponsor: 711 HPW/RH.

MASTER'S THESES

BROOKS, ADAM L., *Improved Multispectral Skin Detection and its Application to Search Space Reduction for Dismount Detection Based on Histograms of Oriented Gradients*. AFIT/GE/ENG/10-05. Faculty Advisor: Maj Michael J. Mendenhall. Sponsor: 711 HPW/RH.

GILLILAND, AMY L., *The Cost of Treating Posttraumatic Stress Disorder and Mild Traumatic Brain Injuries*. AFIT/GFA/ENV/10-M01. Faculty Advisor: Maj Jeremy M. Slagley. Sponsor: 711 HPW/RH.

HALE, BRIAN L., *Mission Assurance: A Review of Continuity of Operations Guidance for Application to Cyber Incident Mission Impact Assessment (CIMIA)*. AFIT/GIR/ENV/10-J01. Faculty Advisor: Dr. Michael Grimaila. Sponsor: 711 HPW/RH.

HOMUNG, MATTHEW P., *Flexible Computing Architecture for Real Time Skin Detection*. AFIT/GCE/ENG/10-02. Faculty Advisor: Maj Michael J. Mendenhall. Sponsor: 711 HPW/RH.

LaROCHE, BRANDON C., *Analysis of Expedient Field Decontamination Methods for the XMX/2L-MIL High-Volume Aerosol Sampler*. AFIT/GWM/ENP/09-D01. Faculty Advisor: Lt Col David A. Smith. Sponsor: 711 HPW/RH.

MUNFAKH, ANTOINE N., *Method Of Measuring The Economic Impact of a Radiological Dispersal Event within an Urban Environment*. AFIT/GFA/ENV/10-M03. Faculty Advisor: Lt Col David A. Smith. Sponsor: 711 HPW/RH.

PESKOSKY, KEITH R., *Design of a Monocular Multi-Spectral Skin Detection, Melanin Estimation, and False-Alarm Suppression System*. AFIT/GE/ENG/10-24. Faculty Advisor: Maj Michael J. Mendenhall. Sponsor: 711 HPW/RH.

GRADUATE RESEARCH PAPERS

EVANS, MICKEY R., *An Informational Analysis and Communications Squadron Survey of Cyberspace Mission Assurance*. AFIT/IDE/ENV/10-J01. Faculty Advisor: Dr. Michael Grimaila. Sponsor: 711 HPW/RH.

AFRL: 711th HUMAN PERFORMANCE WING/USAFSAM

MASTER'S THESES

COOPER, CASEY W., *High Volume Air Sampling for Viral Aerosols: A Comparative Approach*. AFIT/GES/ENV/10-M01. Faculty Advisor: Maj Jeremy M. Slagley. Sponsor: USAFSAM.

AFRL: INFORMATION DIRECTORATE

DOCTORAL DISSERTATIONS

COMPTON, MATTHEW D., *Improving the Quality of Service and Security of Military Networks with a Network Tasking Order Process*. AFIT/DCS/ENG/10-09. Faculty Advisor: Dr. Kenneth M. Hopkinson. Sponsor: AFRL/RI.

KARRELS, DANIEL R., *Large-Scale Distributed Coalition Formation*. AFIT/DCE/ENG/09-11. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: AFRL/RI.

MASTER'S THESES

BEHRING, ADAM J., *Applying Image Matching to Video Analysis*. AFIT/GCE/ENG/10-072. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: AFRL/RI.

BOROWSKI, JOHN F., *Reputation-Based Trust for a Cooperative, Agent-Based Backup Protection Scheme for Power Networks*. AFIT/GCO/ENG/10-04. Faculty Advisor: Dr. Kenneth M. Hopkinson. Sponsor: AFRL/RI.

DODGE, DUSTYN A., *Cyber Situational Awareness Using Live Hypervisor-Based Virtual Machine Introspection*. AFIT/GCE/ENG/10-07. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: AFRL/RI.

LUPIEN, NICHOLAS A., *Scalable and Fault Tolerant Group Key Management*. AFIT/GCS/ENG/10-05. Faculty Advisor: Dr. Kenneth M. Hopkinson. Sponsor: AFRL/RI.

AFRL: MATERIALS AND MANUFACTURING DIRECTORATE

MASTER'S THESES

CHRISTENSEN, DEVON T., *Fatigue Behavior of an Advanced SiC/SiC Composite at Elevated Temperature in Air and in Steam*. AFIT/GAE/ENY/09-D02. Faculty Advisor: Dr. Marina B. Ruggles-Wrenn. Sponsor: AFRL/RX.

DELAPASSE, JACOB, *Fatigue Behavior of an Advanced SiC/SiC Composite with an Oxidation Inhibited Matrix at 1200°C in Air and in Steam*. AFIT/GAE/ENY/10-M07. Faculty Advisor: Dr. Marina B. Ruggles-Wrenn. Sponsor: AFRL/RX.

FERRERI, MATTHEW R., *Particulate Characterization and Control Evaluation for Carbon Fiber Composite Aircraft Crash Recovery Operations*. AFIT/GIH/ENV/10-M01. Faculty Advisor: Maj Jeremy M. Slagley. Sponsor: AFRL/RX.

HARRIS, THOMAS R., *Optical Properties of Si, Ge, GaAs, GaSb, InAs, and InP at Elevated Temperatures*. AFIT/GAP/ENP/10-M08. Faculty Advisor: Dr. Yung Kee Yeo. Sponsor: AFRL/RX.

HERR, NICHOLAS C., *AFM-Patterned 2-D Thin-Film Photonic Crystal Analyzed by Complete Angle Scatter*. AFIT/GMS/ENP/10-M01. Faculty Advisor: Dr. Larry W. Burggraf. Sponsor: AFRL/RX.

KARCHER, KENNETH M., *Optimization of Environmental Conditions to Maximize Carbon Dioxide Sequestration Through Algal Growth*. AFIT/GES/ENV/10-M03. Faculty Advisor: Dr. Charles A. Bleckmann. Sponsor: AFRL/RX & University of Dayton Research Institute.

LUNDELL, CHRISTOPHER A., *Characterization and Measurement of Passive and Active Metamaterial Devices*. AFIT/GE/ENG/10-15. Faculty Advisor: Dr. Peter J. Collins. Sponsor: AFRL/RX.

ROMAN, CALVIN T., *Investigation of Thermal Management and Metamaterials*. AFIT/GE/ENG/10-26. Faculty Advisor: Maj Lavern A. Starman. Sponsor: AFRL/RX.

SMITH, NINA R., *Increasing the Sensitivity of Surface Acoustic Wave (SAW) Chemical Sensors and other Chemical Sensing Investigations*. AFIT/GE/ENG/10-28. Faculty Advisor: Dr. Ronald Coutu. Sponsor: AFRL/RX.

AFRL: MUNITIONS DIRECTORATE

MASTER'S THESES

LAKE, ROBERT A., *Integrated Microelectromechanical Systems (MEMS) Based Safe and Arming Devices for Airborne Munitions*. AFIT/GE/ENG/10-12. Faculty Advisor: Maj Lavern A. Starman. Sponsor: AFRL/RW.

SLAUGHTER, ROBERT C., *Positron Annihilation Ratio Spectroscopy (PsARS) Applied to Positronium Formation Studies*. AFIT/GNE/ENP/10-M07. Faculty Advisor: Dr. Larry W. Burggraf. Sponsor: AFRL/RW.

AFRL: PROPULSION DIRECTORATE

DOCTORAL DISSERTATIONS

McCALL, JONATHAN F., *Discrete Film Cooling in a Rocket with Curved Walls*. AFIT/DS/ENY/09-D02. Faculty Advisor: Lt Col Richard D. Branam. Sponsor: AFRL/RZ.

MASTER'S THESES

CARROLL, DANIEL R., *Flow Visualization Study of Passive Flow Control Features on a Film-Cooled Turbine Blade Leading Edge*. AFIT/GAE/ENY/09-D01. Faculty Advisor: Dr. Paul I King. Sponsor: AFRL/RZ.

FIEVISOHN, ROBERT T., *Numerical Investigation of Pre-detonator Geometries for PDE Applications*. AFIT/GAE/ENY/10-M09. Faculty Advisor: Dr. Paul I King. Sponsor: AFRL/RZ.

HISEROTE, RYAN M., *Analysis of Hybrid-Electric Propulsion System Designs for Small Unmanned Aircraft Systems*. AFIT/GAE/ENY/10-M11. Faculty Advisor: Lt Col Frederick G. Harmon. Sponsor: AFRL/RZ.

HRAD, PAUL M., *Conceptual Design Tool For Fuel-Cell Powered Micro Air Vehicles*. AFIT/GAE/ENY/10-M12. Faculty Advisor: Lt Col Frederick G. Harmon. Sponsor: AFRL/RZ.

KENAN, DANIEL A., *Xenon and Krypton Characterization in Satellite Thrusters*. AFIT/GAE/ENY/10-M14. Faculty Advisor: Lt Col Richard D. Branam. Sponsor: AFRL/RZ.

KINSEL, WAYNE C., *Environmental Life Cycle Assessment of Coal-Biomass to Liquid Jet Fuel Compared to Petroleum-Derived JP-8 Jet Fuel*. AFIT/GEM/ENV/10-M05. Faculty Advisor: Dr. Charles A. Bleckmann. Sponsor: AFRL/RZ.

LEE, DANIEL B., *Velocity Plume Profiles for Hall Thrusters Using Laser Diagnostics*. AFIT/GA/ENY/10-J01. Faculty Advisor: Lt Col Richard D. Branam. Sponsor: AFRL/RZ.

PAEK, RICHARD I., *Back-pressure Effect on Shock-Train Location in a Scramjet Engine Isolator*. AFIT/GAE/ENY/10-M17. Faculty Advisor: Dr. Paul I. King. Sponsor: AFRL/RZ.

SELSTROM, JEREMY J., *Thrust and Performance Study of Micro Pulsed Plasma*. AFIT/GAE/ENY/10-M21. Faculty Advisor: Lt Col Richard D. Branam. Sponsor: AFRL/RZ.

SINCOCK, ANDREW L., *Design of a Film Cooling Experiment For Rocket Engines*. AFIT/GAE/ENY/10-M23. Faculty Advisor: Lt Col Richard D. Branam. Sponsor: AFRL/RZ.

WILSON, CARY W., *Performance of a Small Internal Combustion Engine Using N-Heptane and Iso-Octane*. AFIT/GAE/ENY/10-M28. Faculty Advisor: Dr. Paul I King. Sponsor: AFRL/RZ.

AFRL: SENSORS DIRECTORATE

DOCTORAL DISSERTATIONS

BIRRER, BOBBY D., *Developing a Qualia-Based Multi-Agent Architecture for Use in Malware Detection*. AFIT/DCS/ENG/10-01. Faculty Advisor: Dr. Richard A. Raines. Sponsor: AFRL/RZ.

GILBERT, KEVIN W., *Investigation into Contact Resistance and Damage of Metal Contacts Used in RF-MEMS Switches*. AFIT/DS/ENY/09-J03. Faculty Advisor: Dr. Shankar Mall. Sponsor: AFRL/RZ.

HOOVER, DAYLOND J., *Coalition Formation under Uncertainty*. AFIT/DEE/ENG/10-05. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: AFRL/RZ.

LARSON, CRAIG D., *An Integrity Framework for Image-Based Navigation Systems*. AFIT/DEE/ENG/10-03. Faculty Advisor: Dr. John R. Raquet. Sponsor: AFRL/RZ.

NUNEZ, ABEL S., *A Physical Model of Human Skin and Its Application for Search and Rescue*. AFIT/DEO/ENG/09-14. Faculty Advisor: Maj Michael J. Mendenhall. Sponsor: AFRL/RZ.

WAGNER, TORREY J., *All Solid-State Mid-IR Laser Development, Nonlinear Absorption Investigation and Laser-Induced Damage Study*. AFIT/DS/ENP/10-S07. Faculty Advisor: Dr. Robert L. Hengehold. Sponsor: AFRL/RZ.

MASTER'S THESES

ALLEN, CHRISTOPHER I., *Effects of Channel Mismatches on Beamforming and Signal Detection*. AFIT/GE/ENG/10-01. Faculty Advisor: Dr. Richard K. Martin. Sponsor: AFRL/RZ.

ANILAO, JENNIFER C., *Utilizing the Digital Fingerprint Method for Secure Key Generation*. AFIT/GE/ENG/10-02. Faculty Advisor: Dr. Yong C. Kim. Sponsor: AFRL/RZ.

ARRIAGADA, MANUEL E., *Performance of Scattering Matrix Decomposition and Color Spaces for Synthetic Aperture Radar Imagery*. AFIT/GE/ENG/10-03. Faculty Advisor: Maj Michael A. Saville. Sponsor: AFRL/RZ.

BRADY, STEVEN H., *Frequency Diverse Array Radar: Signal Characterization and Measurement Accuracy*. AFIT/GE/ENG/10-04. Faculty Advisor: Maj Michael A. Saville. Sponsor: AFRL/RZ.

- DeGREGORIA, ANTHONY J., *Gravity Gradiometry and Map Matching: An Aid to Aircraft Inertial Navigation Systems*. AFIT/GAE/ENY/10-M06. Faculty Advisor: Lt Col Richard E. Huffman. Sponsor: AFRL/RV.
- GROSS, AARON A., *Handshaking Protocols and Jamming Mechanisms for Blind Rendezvous in a Dynamic Spectrum Access Environment*. AFIT/GCO/ENG/10-09. Faculty Advisor: Maj Ryan A. Thomas. Sponsor: AFRL/RV.
- GUNN, WILLIAM E., JR., *Application of the Three Short Calibration Technique in a Low Frequency Focus Beam System*. AFIT/GE/ENG/10-10. Faculty Advisor: Dr. Michael J. Havrilla. Sponsor: AFRL/RV.
- HURLIMAN, MORGAN L., *An Assessment of Target to Ground Interactions for Radar Cross Section Measurements*. AFIT/GE/ENG/10-11. Faculty Advisor: Dr. Peter J. Collins. Sponsor: AFRL/RV.
- LONG, IV., LESTER C., *An Approach to Large Scale Radar-Based Modeling and Simulation*. AFIT/GE/ENG/10-14. Faculty Advisor: Maj Michael A. Saville. Sponsor: AFRL/RV.
- MASSMAN, JEFFREY P., *Artificial Inhomogeneous Tapered Impedance Sheet Characterization and Applications*. AFIT/GE/ENG/10-16. Faculty Advisor: Dr. Michael J. Havrilla. Sponsor: AFRL/RV.
- MAYO, KENNETH W., *Multi-Objective Constraint Satisfaction for Mobile Robot Area Defense*. AFIT/GCE/ENG/10-03. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: AFRL/RV.
- McGOWAN, JOHN E., *The Effect of Synthetic Aperture Radar Image Resolution on Target Discrimination*. AFIT/GE/ENG/10-18. Faculty Advisor: Dr. Andrew J. Terzuoli. Sponsor: AFRL/RV & NASIC.
- MILLER, COREY M., *Evolutionary Artificial Neural Network Weight Tuning to Optimize Decision Making for an Abstract Game*. AFIT/GCS/ENG/10-06. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: AFRL/RV.
- MUNNS, SHELDON A., *Spectral Domain RF Fingerprinting for 802.11 Wireless Devices*. AFIT/GE/ENG/10-19. Faculty Advisor: Dr. Michael A. Temple. Sponsor: AFRL/RV.
- MUTLU, YASIN A., *Aiding GPS with Additional Satellite Navigation Services*. AFIT/GSS/ENG/10-01. Faculty Advisor: Lt Col Michael J. Stepaniak. Sponsor: AFRL/RV.
- NABER, NATHAN P., *Real Time Fault Detection and Diagnostics Using FPGA-Based Architecture*. AFIT/GCE/ENG/10-04. Faculty Advisor: Dr. Yong C. Kim. Sponsor: AFRL/RV.
- NAKATA, ADAM L., *Temperature Detection Using Digital Fingerprinting*. AFIT/GE/ENG/10-20. Faculty Advisor: Dr. Yong C. Kim. Sponsor: AFRL/RV.
- NELMS, MATTHEW E., *Development and Evaluation of a Multistatic Ultrawideband Random Noise Radar*. AFIT/GE/ENG/10-21. Faculty Advisor: Dr. Peter J. Collins. Sponsor: AFRL/RV.
- STACKHOUSE, MICHAEL J., *Nanoporous Energetic Silicon-Based Anti-Tamper Response*. AFIT/GE/ENG/10-29. Faculty Advisor: Maj Lavern A. Starman. Sponsor: AFRL/RV.
- VOETBERG, BENJAMIN J., *Feature Characterization of Related Stimulus-Response Pulses from Digital Systems*. AFIT/GE/ENG/10-30. Faculty Advisor: Dr. Michael A. Temple. Sponsor: AFRL/RV.

GRADUATE RESEARCH PAPERS

- DAVIS, MICHAEL N. and KABBAN, REGINALD W., *Developing Metrics for Evaluating Competing Layered Sensing Architectures*. AFIT/ISE/ENV/10-J01. Faculty Advisor: Dr. David R. Jacques. Sponsor: AFRL/RV.

KABBAN, REGINALD W., See DAVIS, MICHAEL N.

AFRL: SPACE VEHICLES DIRECTORATE

MASTER'S THESES

JOHNSON, KIRK W., *Relative Orbit Elements for Satellites in Elliptical Orbits*. AFIT/GA/ENY/10-M04. Faculty Advisor: Lt Col Douglas D. Decker. Sponsor: AFRL/RV.

SNIDER, RYAN E., *Attitude Control of a Satellite Simulator Using Reaction Wheels and a PID Controller*. AFT/GAE/ENY/10-M24. Faculty Advisor: Lt Col Eric D. Swenson. Sponsor: AFRL/RV.

AIR FORCE GLOBAL LOGISTICS SUPPORT CENTER

MASTER'S THESES

BOERBOOM, JASON S., *A Linear Programming Approach for Determining Travel Cost Minimizing ECSS Training Locations*. AFIT/GCA/ENS/10-01. Faculty Advisor: Dr. Jeffrey A. Ogden. Sponsor: AF/A4IT.

MacKENZIE, ADAM S., *An Exploration of the Effects of Maintenance Manning on Combat Mission Readiness Utilizing Agent Based Modeling*. AFIT/OR/MS/ENS/10-07. Faculty Advisor: Dr. John O. Miller. Sponsor: AFGLSC.

PARK, ANSON R., *Simulation Analysis of High Velocity Maintenance for the B-1B*. AFIT/OR/MS/ENS/10-08. Faculty Advisor: Dr. John O. Miller. Sponsor: AFGLSC.

PARSON, CARL R., *Simulation Modeling and Analysis of TNMCS for the B-1 Strategic Bomber*. AFIT/OR/MS/ENS/10-09. Faculty Advisor: Dr. John O. Miller. Sponsor: AFGLSC.

TOBIN, BRIAN P., *Supply Chain Resilience: Assessing USAF Weapon System Life Cycle*. AFIT/LSCM/ENS/10-11. Faculty Advisor: Lt Col Timothy J. Pettit. Sponsor: AFGLSC.

ARNOLD ENGINEERING DEVELOPMENT CENTER

MASTER'S THESES

DOOLEY, ALAINA D., *Screening Techniques and Randomization Restrictions in Wind Tunnel Testing, Using Design of Experiments*. AFIT/GAM/ENC/10-01. Faculty Advisor: Maj Shay R. Capehart. Sponsor: AEDC/XP.

WYMAN, DANA C., *Best Practices In Government Acquisition: A Test Of The Government Accountability Office's Knowledge-Based Acquisition Theory*. AFIT/GCA/ENV/10-M05. Faculty Advisor: Lt Col R. David Fass. Sponsor: AEDC/FM.

AIR FORCE TEST PILOT SCHOOL

MASTER'S THESES

REIN, DONEVAN A., *Disturbance Observer: Design and Flight Test of a Large Envelope Flight Controller*. AFIT/GAE/ENY/10-M18. Faculty Advisor: Lt Col Paul A. Blue. Sponsor: USAF TPS.

4.6. AIR FORCE SPECIAL OPERATIONS COMMAND

MASTER'S THESES

GRAESSLE, MARC J., *Evaluation of Hazardous Airborne Particulate and Gaseous Exposure to Flight Crew Members During the Firing of the 25mm, 40mm and 105mm Weapons in the AC-130U Gunship*. AFIT/GIH/ENV/10-M02. Faculty Advisor: Maj Jeremy M. Slagley. Sponsor: AFSOC.

4.7. AIR MOBILITY COMMAND

MASTER'S THESES

GOODRICH, PRESTON L., *Delivery Time Variance Reduction in the Military Supply Chain*. AFIT/OR/MS/ENS/10-02. Faculty Advisor: Dr. James T. Moore. Sponsor: HQ AMC/A9.

KIMAZ, EVREN, *Fuel Efficiency Assessment with DEA*. AFIT/LSCM/ENS/10-07. Faculty Advisor: Dr. Alan W. Johnson. Sponsor: HQ AMC/A3.

LeBLANC, RYAN L., *The Effects of Opinion Leaders and Change Messages on Organization Member Change Attitudes: A Field Experiment*. AFIT/GEM/ENV/10-M6. Faculty Advisor: Lt Col Daniel T. Holt. Sponsor: HQ AMC/A7.

REHMERT, PHILLIP M., *Manpower Cost Analysis of a Distributed En Route Support Structure Versus a Consolidated En Route Support Structure*. AFIT/LSCM/ENS/10-10. Faculty Advisor: Dr. William A. Cunningham. Sponsor: HQ AMC/A9.

GRADUATE RESEARCH PAPERS

BUCH, GEORGE M., JR., *AMC's Next Strategic Airlifter: The Blended Wing Body?* AFIT/IMO/ENS/10-01. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: HQ AMC.

CASEY, BRANDON A., *Airlift Cargo Hub Port Hold Times: Controlling Variations in Defense Supply Chain Delivery*. AFIT/IMO/ENS/10-03. Faculty Advisor: Dr. James T. Moore. Sponsor: HQ AMC.

GRAY, MYERS S., *The Effects of Cargo Height Distribution on B-747 and C-17 Airlift*. AFIT/IMO/ENS/10-06. Faculty Advisor: Dr. James T. Moore. Sponsor: HQ AMC.

JACOBS, VINCENT M., *Analysis of C-17 Departure Reliability and Maintenance Metrics*. AFIT/IMO/ENS/10-07. Faculty Advisor: Maj Shay R. Capehart. Sponsor: HQ AMC.

MOE, CRAIG D., *What is the best use(s) and mission(s) of the C-27J?* AFIT/IMO/ENS/10-09. Faculty Advisor: Dr. James T. Moore. Sponsor: HQ AMC.

MORRISON, PHILIP G., *Reballasting the KC-135 Fleet for Fuel Efficiency*. AFIT/IMO/ENS/10-10. Faculty Advisor: Maj Daniel D. Mattioda. Sponsor: HQ AMC.

OMDAL, CHRISTOPHER N., *Air Cargo Tenders: Theater Express for the World*. AFIT/IMO/ENS/10-11. Faculty Advisor: Dr. William A. Cunningham. Sponsor: HQ AMC.

SJOSTEDT, TRAVIS D., *Active Associate Units; Benefits and Drawbacks*. AFIT/IMO/ENS/10-12. Faculty Advisor: Dr. Alan R. Heminger. Sponsor: HQ AMC.

SURDYK, BRIAN A., *An Analysis of Time Series Forecasting Methods for the Airlift of Palletized Sustainment*. AFIT/IMO/ENS/10-14. Faculty Advisor: Dr. James T. Moore. Sponsor: HQ AMC.

WILLIAMS, JASON T., *Tactical Unmanned Airlift, A Business Case Study*. AFIT/IMO/ENS/10-16. Faculty Advisor: Maj Daniel D. Mattioda. Sponsor: HQ AMC.

4.8. AIR FORCE SPACE COMMAND

MASTER'S THESES

BARNARD, CURTIS P., *Hijacking User Uploads to Online Persistent Data Repositories for Covert Data Exfiltration*. AFIT/GCO/ENG/10-16. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: 318 IOG/DD.

BIRCH, SAMUEL W., *Performance Characteristics of a Kernel-Space Packet Capture Module*. AFIT/GCO/ENG/10-03. Faculty Advisor: Dr. Robert F. Mills. Sponsor: 90 IOS/TA.

KOVACH, NICHOLAS S., *Accelerating Malware Detection via a Graphics Processing Unit*. AFIT/GCO/ENG/10-12. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: 688 IOG.

THOMAS, BRENNON D., *Performance Evaluation of a Field Programmable Gate Array-Based System for Detecting and Tracking Peer-to-Peer Protocols on a Gigabit Ethernet Network*. AFIT/GCO/ENG/10-20. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: 688 IOG.

GLOBAL POSITIONING SYSTEMS WING

MASTER'S THESES

McGINTHY, JASON M., *Global Navigation Satellite System Software Defined Radio*. AFIT/GE/ENG/10-17. Faculty Advisor: Dr. John F. Raquet. Sponsor: GPSW/EN.

SPACE AND MISSILE SYSTEMS CENTER

MASTER'S THESES

DILLON, DOUGLAS R. and STYERS, ENRIQUETA M., *Analyzing Systems Integration Best Practices and Assessment in DOD Space Systems Acquisition*. AFIT/GSE/ENV/09-02DL. Faculty Advisor: Dr. John M. Colombi. Sponsor: SMC.

MERSKI, NICHOLAS J., *Tailored Systems Architecture for Design of Space Science and Technology Missions Using DODAF V2.0*. AFIT/GSE/ENV/09-04DL. Faculty Advisor: Dr. John M. Colombi. Sponsor: SMC.

STYERS, ENRIQUETA M., See DILLON, DOUGLAS R.

SPACE DEVELOPMENT AND TEST WING

MASTER'S THESES

LANGENBRUNNER, AMANDA J. and TRAUTWEIN MARY R., *Extending the Strategy Based Risk Model Using the Delphi Method: An Application to the Validation Process for Research and Development Satellites*. AFIT/GSE/ENV/09-03DL. Faculty Advisor: Dr. John M. Colombi. Sponsor: SDTW/SDSG.

TOPHAM, JASON E., *Satellite Ground Systems Interoperability Measurement and Analysis*. AFIT/GSE/ENV/09-01DL. Faculty Advisor: Dr. David R. Jacques. Sponsor: SDTW/SDS.

TRAUTWEIN, MARY R., See LANGENBRUNNER, AMANDA J.

4.9. USAF FIELD OPERATING AGENCIES

AIR FORCE CENTER FOR ENGINEERING AND THE ENVIRONMENT

MASTER'S THESES

VUONG, KHAI H., *Modeling the Fate of Groundwater Contaminants Resulting from Leakage of Butanol-blended Fuel*. AFIT/GES/ENV/10-M06. Faculty Advisor: Dr. Mark N. Goltz. Sponsor: AFCEE/TD.

AIR FORCE CIVIL ENGINEER SUPPORT AGENCY

MASTER'S THESES

MENDEZLLOVET, EDDIE A., *Codifying Information Assurance Controls for Department of Defense (DoD) Supervisory Control and Data Acquisition (SCADA) Systems (U)*. AFIT/GCO/ENG/10-13. Faculty Advisor: Lt Col Jeffrey W. Humphries. Sponsor: AFCESA/CC.

AIR FORCE FLIGHT STANDARDS AGENCY

GRADUATE RESEARCH PAPERS

HUNTER, TRACY N., *Performance of Military Cargo Aircraft Using Required Navigation Performance Departures*. AFIT/IOA/ENS/10-07. Faculty Advisor: Dr. Raymond Hill. Sponsor: HQ AFFSA/A3.

AIR FORCE PERSONNEL CENTER

MASTER'S THESES

JEONG, GREG S., *A Multi-Objective Approach to a Bipartite Assignment Matching Problem Using Weighted Values from Multiple Constraints*. AFIT/OR/MS/ENS/10-05. Faculty Advisor: Dr. Jeffrey D. Weir. Sponsor: 369th Recruiting Squadron.

AIR FORCE TECHNICAL APPLICATIONS CENTER

DOCTORAL DISSERTATIONS

DAVIS, BRIAN S., *Time Dependent Channel Packet Calculation of Two Nucleon Scattering Matrix Elements*. AFIT/DS/ENP/10-M03. Faculty Advisor: Dr. David E. Weeks. Sponsor: AFTAC.

MASTER'S THESES

HASTINGS, ERIC W., *Using Remotely Piloted Aircraft to Support National Technical Nuclear Forensics*. AFIT/OR/MS/ENS/10-04. Faculty Advisor: Lt Col Stephen P. Chambal. Sponsor: AFTAC.

AIR FORCE WEATHER AGENCY

MASTER'S THESES

MEIER, DAVID C., *Application of Satellite-Derived Wind Profiles to Joint Precision Airdrop System (JPADS) Operations*. AFIT/GAP/ENP/10-M10. Faculty Advisor: Dr. Steven T. Fiorino. Sponsor: Det 3, 16 WS & 516 AESW/XR.

4.10. DEPARTMENT OF DEFENSE

DEFENSE THREAT REDUCTION AGENCY

DOCTORAL DISSERTATIONS

WILLIAMS, CHRISTOPHER S., *Three Dimensional Positron Annihilation Momentum Measurement Technique (3DPAMM) Applied to Measure Oxygen-Atom Defects in 6H Silicon Carbide*. AFIT/DS/ENP/10-M02. Faculty Advisor: Dr. Larry W. Burggraf. Sponsor: AFOSR/NL, DTRA, & DHS.

WOOTEN, DAVID J., *Electronic Structure of Lithium Tetraborate*. AFIT/DS/ENP/10-J01. Faculty Advisor: LTC John W. McClory. Sponsor: DTRA.

MASTER'S THESES

BAUER, WILLIAM A., *Determination of Nuclear Yield from Thermal Degradation of Automobile Paint*. AFIT/GNE/ENP/10-M11. Faculty Advisor: Dr. Larry W. Burggraf. Sponsor: DTRA.

BOYCE, NATHAN O., *Thermal Neutron Point Source Imaging using a Rotating Modulation Collimator (RMC)*. AFIT/GNE/ENP/10M-01. Faculty Advisor: Capt Benjamin R. Kowash. Sponsor: DTRA.

HAMBLEEN, STEWART S., *A Physics Based Analytical Model for the Near Field Electromagnetic Pulse Generated by a Surface Nuclear Detonation*. AFIT/GNE/ENP/10-M04. Faculty Advisor: Dr. James Petrosky. Sponsor: DTRA.

KLEINSCHMIDT, NEAL B., *The Material Properties of CsSnBr₃ and CsBr:Sn_{0.1%} and Their Potential as Scintillator Detector Material*. AFIT/GNE/ENP/10-M05. Faculty Advisor: Capt Benjamin R. Kowash. Sponsor: DTRA.

MIKINA, JANUSZ K., *In-situ, Gate Bias Dependent Study of Neutron Irradiation Effects on AlGaIn/GaN HFETs*. AFIT/GNE/ENP/10M-06. Faculty Advisor: LTC John W. McClory. Sponsor: DTRA.

HIGH ENERGY LASER JOINT TECHNOLOGY OFFICE

DOCTORAL DISSERTATIONS

PITZ, GREG A., *Collisional Dynamics of the Cesium D1 and D2 Transitions*. AFIT/DS/ENP/10-S045. Faculty Advisor: Dr. Glen P. Perram. Sponsor: HELJTO.

SULHAM, CLIFFORD V., *Laser Demonstration and Performance Characterization of an Optically Pumped Alkali Laser System*. AFIT/DS/ENP/10-S06. Faculty Advisor: Dr. Glen P. Perram. Sponsor: HELJTO.

MASTER'S THESES

BOWERS, JAMES C., *Numerical Investigation of Statistical Turbulence Effects on Beam Propagation through 2-D Shear Mixing Layer*. AFIT/GAP/ENP/10-M03. Faculty Advisor: Dr. Steven T. Fiorino. Sponsor: HELJTO.

BUTLER, SAMUEL D., *Calculation of Collisional Cross Sections for the $^2P_{3/2} \rightarrow ^2P_{1/2}$ Transition in Alkali-Noble Gas Systems*. AFIT/GAP/ENP/10-M04. Faculty Advisor: Dr. David E. Weeks. Sponsor: HELJTO.

HACKETT, SHAWN W., *Simulation of a Diode Pumped Alkali Laser, A Three Level Numerical Approach*. AFIT/GAP/ENP/10-M06. Faculty Advisor: Lt Col Jeremy C. Holtgrave. Sponsor: HELJTO.

MILLER, WOODY S., *Rubidium Recycling in a High Intensity Short Duration Pulsed Alkali Laser*. AFIT/GAP/ENP/10-M11. Faculty Advisor: Lt Col Jeremy C. Holtgrave. Sponsor: HELJTO.

THORNTON, DOUGLAS E., *Hard Collisions in Rubidium using Sub-Doppler Spectroscopy*.
AFIT/GEO/ENP/10-M02. Faculty Advisor: Dr. Glen P. Perram. Sponsor: HELJTO.

JOINT IMPROVISED EXPLOSIVE DEVICE DEFEAT ORGANIZATION

MASTER'S THESES

ISALY, LAURA A., *Augmenting Latent Dirichlet Allocation and Rank Threshold Detection with Ontologies*.
AFIT/GCS/ENG/10-03. Faculty Advisor: Maj Eric D. Trias. Sponsor: JIEDDO.

NATIONAL SECURITY AGENCY

MASTER'S THESES

BAI, WILLIAM T., *Development of a Methodology for Customizing Insider Threat Auditing on a Linux Operating System*. AFIT/GCO/ENG/10-01. Faculty Advisor: Dr. Robert F. Mills. Sponsor: NSA.

HANINGTON, ERIC C., *A Comparative Analysis of ASCII and XML Logging Systems*. AFIT/GCO/ENG/10-17. Faculty Advisor: Dr. Rusty O. Baldwin. Sponsor: NSA.

MYERS, JUSTIN M., *A Dynamically Configurable Log-based Distributed Security Event Detection Methodology using Simple Event Correlator*. AFIT/GCO/ENV/10-J02. Faculty Advisor:
Dr. Michael R. Grimala. Sponsor: NSA.

OPERATIONALLY RESPONSIVE SPACE OFFICE

DOCTORAL DISSERTATIONS

STRYKER, AMIE C., *Development of Measures to Assess Product Modularity and Reconfigurability*.
AFIT/DS/ENV/10-M01. Faculty Advisor: Dr. David R. Jacques. Sponsor: ORS Office.

MASTER'S THESES

BAGHAL, LISA A., *Assembly, Integration, and Test Methods for Operationally Responsive Space Satellites*.
AFIT/GAE/ENY/10-M01. Faculty Advisor: Lt Col Eric D. Swenson. Sponsor: ORS Office.

TROTTIER, MICHAEL D., *Accurate Dynamic Response Predictions of PnPSAT I*. AFIT/GA/ENY/10-M12.
Faculty Advisor: Lt Col Eric D. Swenson. Sponsor: ORS Office.

UNITED STATES ARMY AEROMEDICAL RESEARCH LABORATORY

MASTER'S THESES

LANCASTER, KRISTEN M., *Use of Negation in Search*. AFIT/GCO/ENV/10-J01. Faculty Advisor:
Lt Col Jason M. Turner. Sponsor: USAARL.

UNITED STATES CENTRAL COMMAND

GRADUATE RESEARCH PAPERS

FAIRCHILD, IAN M., *Securing Information Exchange Between the TACC and Its Civilian Airlift Partners*.
AFIT/IMO/ENS/10-05. Faculty Advisor: Dr. Robert F. Mills. Sponsor: AFCENT.

UNITED STATES EUROPEAN COMMAND

GRADUATE RESEARCH PAPERS

GREGG, AIMEE N., *Optimizing Crisis Action Planning in the Noncombatant Evacuation Operation Setting*. AFIT/IOA/ENS/Y09-03. Faculty Advisor: Maj Shane N. Hall. Sponsor: EUCOM/EC.

UNITED STATES MARINE CORPS

MASTER'S THESES

GEORGE, DEREK R., *Evaluation of Alternative Technologies to Supply Drinking Water to Marines in Forward Deployed Locations*. AFIT/GES/ENV/10-M02. Faculty Advisor: Dr. Mark N. Goltz. Sponsor: MCES/UI.

STRANGE, RUSSEL A., *Economic Feasibility Of Installing An Anaerobic Digester On A Department Of Defense Installation*. AFIT/GES/ENV/10-M05. Faculty Advisor: Lt Col David A. Smith. Sponsor: Commandant of the Marine Corps.

UNITED STATES NAVAL SCHOOL OF HEALTH SCIENCES

MASTER'S THESES

STUBBS, JOHN E., *Development of a Novel Noise Delivery System for JP-8 Ototoxicity Studies*. AFIT/GIH/ENV/10-M04. Faculty Advisor: Maj Jeremy M. Slagley. Sponsor: Navy Health Research Center Office of Environment, Safety, and Health.

UNITED STATES STRATEGIC COMMAND

MASTER'S THESES

COTE, MICHAEL D., *Screening and Sufficiency in Multiobjective Decision Problems with Large Alternative Sets*. AFIT/OR/MS/ENS/10-12. Faculty Advisor: Dr. Jeffery Weir. Sponsor: JFCC-ISR DJS-5.

4.11. OTHER FEDERAL AGENCIES

DEPARTMENT OF HOMELAND SECURITY

DOCTORAL DISSERTATIONS

MILLER, TY E., *Early Time Characterization of Fresh Nuclear Debris Using Gamma Spectroscopy*. AFIT/DS/ENP/10-S04. Faculty Advisor: Dr. Charles J. Bridgman. Sponsor: DHS/DNDO.

WILLIAMS, CHRISTOPHER S., *Three Dimensional Positron Annihilation Momentum Measurement Technique (3DPAMM) Applied to Measure Oxygen-Atom Defects in 6H Silicon Carbide*. AFIT/DS/ENP/10-M02. Faculty Advisor: Dr. Larry W. Burggraf. Sponsor: AFOSR/NL, DTRA, & DHS.

MASTER'S THESES

YOUNG, CHRISTOPHER M., *Gadolinium Oxide/Silicon Thin Film Heterojunction Solid-State Neutron Detector*. AFIT/GNE/ENP/10M-10. Faculty Advisor: LTC John W. McClory. Sponsor: DHS/DNDO.

ENVIRONMENTAL PROTECTION AGENCY

MASTER'S THESES

HANSEN, LEIF A., *An Evaluation of a Networked Radiation Detection System*. AFIT/GWM/ENP/10-M02. Faculty Advisor: Lt Col David A. Smith. Sponsor: US EPA.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

MASTER'S THESES

BELLOWS, CHARLIE T., *Minimizing Losses in a Space Laser Power Beaming System*. AFIT/GSS/ENY/10-M02. Faculty Advisor: Dr. Jonathan T. Black. Sponsor: NASA.

ELLIOTT, BRIAN P., *Evaluation of Interplanetary Magnetic Field Tracing Models Using Impulsive SEPs*. AFIT/GAP/ENP/10-M05. Faculty Advisor: Lt Col Ariel O. Acebal. Sponsor: NASA.

KELLER, NICHOLAS M., *Mission Analysis and Design for Space Based Inter-Satellite Laser Power Beaming*. AFIT/GA/ENY/10-M05. Faculty Advisor: Dr. Jonathan T. Black. Sponsor: NASA.

NATIONAL CONSORTIUM FOR MASINT RESEARCH

MASTER'S THESES

HAIDUCEK, JOHN D., *Experimental Validation Techniques for the HELEEOS Off-Axis Laser Propagation Model*. AFIT/GAP/ENP/10-M07. Faculty Advisor: Dr. Steven T. Fiorino. Sponsor: NSF & NCMR.

NATIONAL SCIENCE FOUNDATION

MASTER'S THESES

HAIDUCEK, JOHN D., *Experimental Validation Techniques for the HELEEOS Off-Axis Laser Propagation Model*. AFIT/GAP/ENP/10-M07. Faculty Advisor: Dr. Steven T. Fiorino. Sponsor: NSF & NCMR.

4.12. NON-FEDERAL SPONSORS

BALL AEROSPACE AND TECHNOLOGIES CORPORATION

MASTER'S THESES

LeBLANC, KEVIN R., *Satellite-Based Fusion of Imaging Sensors and Georegistered Map Data for Precise Geolocation and Target Tracking*. AFIT/GE/ENG/10-13. Faculty Advisor: Lt Col Michael J. Veth. Sponsor: Ball Aerospace and Technologies Corporation.

PROJECT MANAGEMENT INSTITUTE COLLEGE OF PERFORMANCE MANAGEMENT

MASTER'S THESES

JACK, DENNIS E., *Contract Over Target Baseline (OTB) Effect on Earned Value Management's Cost Performance Index (CPI)*. AFIT/GCA/ENC/10-02. Faculty Advisor: Dr. Edward D. White. Sponsor: PMI College of Performance Management.

THICKSTUN, KRISTINE E., *Predicting Over Target Baseline (OTB) Acquisition Contracts*. AFIT/GCA/ENC/10-01. Faculty Advisor: Dr. Edward D. White. Sponsor: PMI College of Performance Management.

UNIVERSITY OF DAYTON

MASTER'S THESES

KARCHER, KENNETH M., *Optimization of Environmental Conditions to Maximize Carbon Dioxide Sequestration Through Algal Growth*. AFIT/GES/ENV/10-M03. Faculty Advisor: Dr. Charles A. Bleckmann. Sponsor: University of Dayton Research Institute & AFRL/RX.

ROWLEY, WILLIAM M., *Nitrogen and Phosphorus Biomass-Kinetic Model for Chlorella vulgaris in a Biofuel Production Scheme*. AFIT/GES/ENV/10-M04. Faculty Advisor: Dr. Charles A. Bleckmann. Sponsor: University of Dayton Research Institute.

UNIVERSITY OF MARYLAND INSTITUTE FOR ADVANCED COMPUTER STUDIES

DOCTORAL DISSERTATIONS

LIKE, ERIC C., *Spectrally-Temporally Adapted Spectrally Modulated Spectrally Encoded (SMSE) Waveform Design for Coexistent CR-Based SDR Applications*. AFIT/DEE/ENG/10-04. Faculty Advisor: Dr. Michael A. Temple. Sponsor: UMIACS/Laboratory for Telecommunications Sciences.

UTAH STATE UNIVERSITY

MASTER'S THESES

RANNEY, DANE P., *Realistic Vertical Atmospheric Profiles and Effects from Limited Surface Observations*. AFIT/GAP/ENP/10-M12. Faculty Advisor: Dr. Steven T. Fiorino. Sponsor: Utah State University Space Dynamics Laboratory.

WRIGHT STATE UNIVERSITY

MASTER'S THESES

HORENZIAK, MICHAEL W., *Low Dose Sarin Leads To Murine Cardiac Dysfunction*. AFIT/GIH/ENV/10-M03. Faculty Advisor: Lt Col David A. Smith. Sponsor: Wright State University Boonshoft School of Medicine.

5. ACADEMIC DEPARTMENT PUBLICATIONS AND FUNDING INFORMATION

5.1. DEPARTMENT OF AERONAUTICS AND ASTRONAUTICS

Access Phone: 937-255-3069, DSN 785-3069

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Homepage: <http://www.afit.edu/en/eny/>

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5.1.1. DOCTORAL DISSERTATIONS

BORDNER, RALPH E., III, *Orbital Tori Construction Using Trajectory Following Spectral Methods*. AFIT/DS/ENY/10-09. Faculty Advisor: Dr. William E. Wiesel. Sponsor: N/A.

GILBERT, KEVIN W., *Investigation into Contact Resistance and Damage of Metal Contacts Used in RF-MEMS Switches*. AFIT/DS/ENY/09-J03. Faculty Advisor: Dr. Shankar Mall. Sponsor: AFRL/RV.

HALE, CHAD S., *Consideration of Wear Rates at High Velocity*. AFIT/DS/ENY/10-08. Faculty Advisor: Dr. Anthony N. Palazotto. Sponsor: AFOSR.

McCALL, JONATHAN F., *Discrete Film Cooling in a Rocket with Curved Walls*. AFIT/DS/ENY/09-D02. Faculty Advisor: Lt Col Richard D. Branam. Sponsor: AFRL/RZ.

5.1.2. MASTER'S THESES

BAGHAL, LISA A., *Assembly, Integration, and Test Methods for Operationally Responsive Space Satellites*. AFIT/GAE/ENY/10-M01. Faculty Advisor: Lt Col Eric D. Swenson. Sponsor: ORS.

BARRETT, JEFFREY A., *Development of a Flapping Wing Design Incorporating Shape Memory Alloy Actuation*. AFIT/GAE/ENY/10-M02. Faculty Advisor: Dr. Jonathan T. Black. Sponsor: AFRL/RB.

BELL, BRYAN M., *Assuring GPS Capabilities Under a Contested Space Environment: An Implementation Plan*. AFIT/GSS/ENY/10-M-01. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: SPAATZ/ARS.

BELLOWS, CHARLIE T., *Minimizing Losses in a Space Laser Power Beaming System*. AFIT/GSS/ENY/10-M02. Faculty Advisor: Dr. Jonathan T. Black. Sponsor: NASA.

BISHER, CHRISTIAN L., *Verification of KAM Theory on Earth Orbiting Satellites*. AFIT/GAE/ENY/10-M03. Faculty Advisor: Dr. William E. Wiesel Jr. Sponsor: N/A.

BOOK, TODD A., *Design Analysis of a Sapce Based Chromotomographic Hyperspectral Imaging Experiment*. AFIT/GA/ENY/10-M01. Faculty Advisor: Dr. Jonathan T. Black. Sponsor: N/A.

BOSTON, JONATHAN T., *Experiments with Geometric Non-Linear Coupling for Analytical Validation*. AFIT/GAE/ENY/10-M04. Faculty Advisor: Lt Col Eric D. Swenson. Sponsor: AFRL/RB.

BROOKS, EVAN M., *Estimating Characteristics of a Maneuvering Reentry Vehicle Observed by Multiple Sensors*. AFIT/GA/ENY/10-M02. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: N/A.

CALL, ROBERT W., *An Aerothermal Analysis of a Hypersonic Glide Vehicle*. AFIT/GA/ENY/10-M03. Faculty Advisor: Dr. Robert B. Greendyke. Sponsor: NASIC.

CARROLL, DANIEL R., *Flow Visualization Study of Passive Flow Control Features on a Film-Cooled Turbine Blade Leading Edge*. AFIT/GAE/ENY/09-D01. Faculty Advisor: Dr. Paul I King. Sponsor: AFRL/RZ.

CHESTERMAN, MICHAEL C., *Collateral Damage Effects of Directed Energy Weapons*. AFIT/GAE/ENY/10-M05. Faculty Advisor: Lt Col Richard E. Huffman. Sponsor: AFRL/RD.

CHRISTENSEN, DEVON T., *Fatigue Behavior of an Advanced SiC/SiC Composite at Elevated Temperature in Air and in Steam*. AFIT/GAE/ENY/09-D02. Faculty Advisor: Dr. Marina B. Ruggles-Wrenn. Sponsor: AFRL/RX.

DeGREGORIA, ANTHONY J., *Gravity Gradiometry and Map Matching: An Aid to Aircraft Inertial Navigation Systems*. AFIT/GAE/ENY/10-M06. Faculty Advisor: Lt Col Richard E. Huffman. Sponsor: AFRL/RV.

DELAPASSE, JACOB, *Fatigue Behavior of an Advanced SiC/SiC Composite with an Oxidation Inhibited Matrix at 1200°C in Air and in Steam*. AFIT/GAE/ENY/10-M07. Faculty Advisor: Dr. Marina B. Ruggles-Wrenn. Sponsor: AFRL/RX.

DIEDRICK, BRADLEY K., *Effects of Prior Aging at 260 °C in Argon on Inelastic Deformation Behavior of PMR-15 Polymer at 260 °C: Experiment and Modeling*. AFIT/GAE/ENY/10-M08. Faculty Advisor: Dr. Marina B. Ruggles-Wrenn. Sponsor: AFOSR.

DRENTH, AARON C., *Laser-Included Fluorescence and Synthetic Jet Fuel Analysis in the Ultra Compact Combustor*. AFIT/GAE/ENY/09-D03. Faculty Advisor: Lt Col Richard D. Branam. Sponsor: AFOSR.

FIEVISOHN, ROBERT T., *Numerical Investigation of Pre-detonator Geometries for PDE Applications*. AFIT/GAE/ENY/10-M09. Faculty Advisor: Dr. Paul I. King. Sponsor: AFRL/RZ.

GRAFF, MICHAEL E., *Development of a Remotely Operated Autonomous Satellite Tracking System*. AFIT/GSS/ENY/10-M03. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: N/A.

HAINGE, ASHTON D., *Validation of a Novel Approach to Solving Multibody Systems Using Hamilton's Weak Principle*. AFIT/GAE/ENY/10-M10. Faculty Advisor: Dr. Donald L. Kunz. Sponsor: AFMC.

HALL, TIMOTHY S., *Orbit Maneuver for Responsive Coverage Using Electric Propulsion*. AFIT/GSS/ENY/10-M04. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: N/A.

HISEROTE, RYAN M., *Analysis of Hybrid-Electric Propulsion System Designs for Small Unmanned Aircraft Systems*. AFIT/GAE/ENY/10-M11. Faculty Advisor: Lt Col Frederick G. Harmon. Sponsor: AFRL/RZ.

HRAD, PAUL M., *Conceptual Design Tool For Fuel-Cell Powered Micro Air Vehicles*. AFIT/GAE/ENY/10-M12. Faculty Advisor: Lt Col Frederick G. Harmon. Sponsor: AFRL/RZ.

JOHNSON, KIRK W., *Relative Orbit Elements for Satellites in Elliptical Orbits*. AFIT/GA/ENY/10-M04. Faculty Advisor: Lt Col Douglas D. Decker. Sponsor: AFRL/RV.

JONES, ROBERT B., *3D Laser Imaging and Computer Modeling of the MQ-9 Reaper Remotely Piloted Aircraft*. AFIT/GAE/ENY/10-M13. Faculty Advisor: Lt Col Christopher M. Shearer. Sponsor: 478 AESG/SYE.

KELLER, NICHOLAS M., *Mission Analysis and Design for Space Based Inter-Satellite Laser Power Beaming*. AFIT/GA/ENY/10-M05. Faculty Advisor: Dr. Jonathan T. Black. Sponsor: NASA.

KENAN, DANIEL A., *Xenon and Krypton Characterization in Satellite Thrusters*. AFIT/GAE/ENY/10-M14. Faculty Advisor: Lt Col Richard D. Branam. Sponsor: AFRL/RZ.

LEE, DANIEL B., *Velocity Plume Profiles for Hall Thrusters Using Laser Diagnostic*. AFIT/GA/ENY/10-J01. Faculty Advisor: Lt Col Richard D. Branam. Sponsor: AFRL/RZ.

LOVE, BRIAN T., *Particle Size Control for PIV Seeding Using Dry Ice*. AFIT/GAE/ENY/10-M15. Faculty Advisor: Dr. Mark F. Reeder. Sponsor: AFRL/RB.

MAGREE, DANIEL P., *A Photogrammetry-Based Hybrid System for Dynamic Tracking and Measurement*. AFIT/GAE/ENY/10-J01. Faculty Advisor: Dr. Jonathan T. Black. Sponsor: AFOSR.

MEADOR, STEPHEN P., *Consideration of Wear Rates at High Velocities*. AFIT/GAE/ENY/10-M16. Faculty Advisor: Dr. Anthony N. Palazotto. Sponsor: AFOSR.

MILLER, STEVEN D., *Investigation of a Novel Compact Vibration Isolation System for Space Applications*. AFIT/GA/ENY/10-M07. Faculty Advisor: Lt Col Eric D. Swenson. Sponsor: N/A.

MORSE, ARTHUR L., *Preliminary Electrical Designs for CTE_x and AFIT Satellite Ground Station*. AFIT/GA/ENY/10-M08. Faculty Advisor: Dr. Jonathan T. Black. Sponsor: N/A.

PAEK, RICHARD I., *Back-pressure Effect on Shock-Train Location in a Scramjet Engine Isolator*. AFIT/GAE/ENY/10-M17. Faculty Advisor: Dr. Paul I. King. Sponsor: AFRL/RZ.

REIN, DONEVAN A., *Disturbance Observer: Design and Flight Test of a Large Envelope Flight Controller*. AFIT/GAE/ENY/10-M18. Faculty Advisor: Lt Col Paul A. Blue. Sponsor: USAF TPS.

SABAT, JOSEPH W., JR., *Structural Response of Slotted Waveguide Antenna Stiffened Structure Components Under Compression*. AFIT/GAE/ENY/10-M19. Faculty Advisor: Dr. Anthony N. Palazotto. Sponsor: AFRL/RB.

SCHNEIDER, MATTHEW T., *Dive Angle Sensitivity Analysis for Flight Test Safety and Efficiency*. AFIT/GAE/ENY/10-M20. Faculty Advisor: Lt Col Richard E. Huffman. Sponsor: 40 FLTS/CC.

SELSTROM, JEREMY J., *Thrust and Performance Study of Micro Pulsed Plasma*. AFIT/GAE/ENY/10-M21. Faculty Advisor: Lt Col Richard D. Branam. Sponsor: AFRL/RZ.

SIMS, TRAVIS W., *A Structural Dynamic Analysis of a Manduca Sexta Forewing*. AFIT/GAE/ENY/10-M22. Faculty Advisor: Dr. Anthony N. Palazotto. Sponsor: AFRL/RB.

SINCOCK, ANDREW L., *Design of a Film Cooling Experiment for Rocket Engines*. AFIT/GAE/ENY/10-M23. Faculty Advisor: Lt Col Richard D. Branam. Sponsor: AFRL/RZ.

SNIDER, RYAN E., *Attitude Control of a Satellite Simulator Using Reaction Wheels and a PID Controller*. AFT/GAE/ENY/10-M24. Faculty Advisor: Lt Col Eric D. Swenson. Sponsor: AFRL/RV.

STARR, WILLIAM J., JR., *Analysis of Slewing and Attitude Determination Requirements for CTE_x*. AFIT/GSS/ENY/10-M05. Faculty Advisor: Dr. Jonathan T. Black. Sponsor: N/A.

SWENSON, PHILIP H., *Development and Design of an AFIT CubeSat Demonstrating Deployable Technology*. AFIT/GAE/ENY/10-M09. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: N/A.

SWITZER, BENJAMIN P., *CFD Analysis of Experimental Wing and Winglet for FalconLAUNCH 8 and the ExFIT Program*. AFIT/GAE/ENY/10-M25. Faculty Advisor: Lt Col Ronald J. Simmons. Sponsor: AFRL/RB.

THOMAS, GRANT M., *Prototype Development and Dynamic Characterization of Deployable CubeSat Booms*. AFIT/GA/ENY/10-M10. Faculty Advisor: Dr. Jonathan T. Black. Sponsor: N/A.

THOMAS, LEVI M., *Flow Measurements Using Particle Image Velocimetry in the Ultra Compact Combustor*. AFIT/GAE/ENY/09-D04. Faculty Advisor: Lt Col Richard D. Branam. Sponsor: AFOSR.

THORN, CAITLIN R., *Off-Design Analysis of a High Bypass Turbofan Using a Pulsed Detonation Combustor*. AFIT/GAE/ENY/10-M26. Faculty Advisor: Dr. Paul I. King. Sponsor: N/A.

TOBEY, URIAH J., *Mission Analysis for Multiple Rendezvous of Near-Earth Asteroids Using Earth Gravity Assist*. AFIT/GA/ENY/10-M11. Faculty Advisor: Dr. William E. Wiesel Jr. Sponsor: N/A.

TROTTIER, MICHAEL D., *Accurate Dynamic Response Predictions of PnPSAT I*. AFIT/GA/ENY/10-M12. Faculty Advisor: Lt Col Eric D. Swenson. Sponsor: ORS.

VINACCO, MICHAEL J., *ExFiT Flight Design and Structural Modeling for FalconLAUNCH VIII Sounding Rocket*. AFIT/GAE/ENY/10-M27. Faculty Advisor: Dr. Jonathan T. Black. Sponsor: AFRL/RB.

WILSON, CARY W., *Performance of a Small Internal Combustion Engine Using N-Heptane and Iso-Octane*. AFIT/GAE/ENY/10-M28. Faculty Advisor: Dr. Paul I. King. Sponsor: AFRL/RZ.

YAPLE, DANIELLE E., *Simulation and Application of GPOPS for Trajectory Optimization and Mission Planning Tool*. AFIT/GAE/ENY/10-M29. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: N/A.

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. Dr. Black's research interests include lightweight and inflatable aerospace structures, structural and nonlinear dynamics, advanced sensing technologies, space systems engineering, and novel orbit analysis. His current work involves developing novel measurement and modeling techniques to characterize the static and dynamic behavior of new large lightweight space structures, micro UAV development, and research into enabling taskable satellites. He is the first AFIT recipient of an AFOSR Young Investigator Award, and was recently named an AIAA Associate Fellow. Tel. 255-3636 x4578, email: Jonathan.black@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

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

"Novel Multifunctional Imaging Chromotomographic Spectrometer Flight Experiment (CTEx)." Sponsor: AS&T Outreach Program. Funding: \$100,000.

"Risk Analysis of Small Satellites." Sponsor: AFRL/RV. Funding: \$65,000.

REFEREED JOURNAL PUBLICATIONS

Black, J.T., Pitcher, N.A., Reeder, M.F., and R.C. Maple, "Videogrammetry Measurements of a Lightweight Flexible Wing in a Wind Tunnel," Journal of Aircraft, Vol. 47, No. 1, Jan. – Feb. 2010, pp. 172-180.

Cobb, R.G., Black, J.T., and E.D. Swenson, "Design and Flight Qualification of the Rigidizable Inflatable Get-Away-Special Experiment, Journal of Spacecraft and Rockets, Vol. 47, No. 4, Jul. – Aug. 2010, pp. 659-669.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Grigsby, D.A. and J.T. Black, "Satellite Capabilities Mapping – Utilizing Small Satellites," 24th AIAA Utah State University Conference on Small Satellites, Logan, UT, Aug. 2010, Paper SSC10-VII-1.

Book, T.A., Starr, W.J., Morse, A.J., Miller, S.D., Black, J.T., Swenson, E.D., Cobb, R.G., and C.R. Hartsfield, "A Design Overview of a Space-Based Chromotomographic Hyperspectral Imaging Experiment," 24th AIAA Utah State University Conference on Small Satellites, Logan, UT, Aug. 2010, Paper SSC10-I-1.

Starr, W.J., Book, T.A., Morse, A.J., Miller, S.D., Swenson, E.D., Cobb, R.G., and J.T. Black, "Target Acquisition/Tracking for the Space-Based Chromotomographic Hyperspectral Imaging Experiment," AIAA/AAS Astrodynamics Specialist Conference, Toronto, Canada, Aug. 2010, AIAA Paper 2010-7655.

Yates, J.M., Spanbauer, B.W., and J.T. Black, "Geostationary Orbit Development and Evaluation for Space Situational Awareness (GODESSA)," AIAA/AAS Astrodynamics Specialist Conference, Toronto, Canada, Aug. 2010, AIAA Paper 2010-7528.

Bellows, C.T., Keller, N.M., and J.T. Black, "Mission Feasibility Study for Space Based Wireless Power Transfer," AIAA/AAS Astrodynamics Specialist Conference, Toronto, Canada, Aug. 2010, AIAA Paper 2010-7522.

- O'Dell, D.C., Bostick, R., Hawks, M.R., Swenson, E.D., Black, J.T., Cobb, R.G., and G.P. Perram, "Chromotomographic Imager Field Demonstration Results," 7th SPIE Airborne Intelligence, Surveillance, Reconnaissance (ISR) Systems and Applications Conference, Apr. 2010, Proc. SPIE, Vol. 7668, 766804 (2010), doi:10.1117/12.849702.
- Swenson, E., Black, J., and R. Cobb, "Correcting the Effects of Orthogonalized Measured Modes When Tuning Finite Element Models," 51st AIAA/ASME/ASCE/AHS/ASC Conference on Structures, Structural Dynamics and Materials, Orlando, FL, Apr. 2010, AIAA Paper 2010-2546.
- Jennings, A., Black, J., Magree, D., Briggs, G., Allen, C., and M. Jameson, "Effect of Camera Setup on Photogrammetry Texture- Based Surface Reconstruction," 51st AIAA/ASME/ASCE/AHS/ASC Conference on Structures, Structural Dynamics and Materials, Orlando, FL, Apr. 2010, AIAA Paper 2010-2749.
- Magree, D., Briggs, G., Allen, C., Jennings, A., Pollock A., and J. Black, "Pan Tilt Zoom Camera System for Dynamic In- Flight Tracking and Measurement," 51st AIAA/ASME/ASCE/AHS/ASC Conference on Structures, Structural Dynamics and Materials, Orlando, FL, Apr. 2010, AIAA Paper 2010-2804.
- Swenson, P., Thomas, G., Cobb, R., and J. Black, "Experiment Deployment Testing of a One Meter Reflector From a CubeSat," 51st AIAA/ASME/ASCE/AHS/ASC Conference on Structures, Structural Dynamics and Materials, Orlando, FL, Apr. 2010, AIAA Paper 2010-2906.
- Thomas, G., Swenson, P., Cobb, R., Swenson, E., and J. Black, "Prototype Development and Dynamic Characterization of Deployable CubeSat Booms," 51st AIAA/ASME/ASCE/AHS/ASC Conference on Structures, Structural Dynamics and Materials, Orlando, FL, Apr. 2010, AIAA Paper 2010-2907.
- Miller, S., Book, T., Morse, A., Swenson, E., Cobb, R., and J. Black, "Structural Design and Analysis of a Novel Space- Based Chromotomographic Spectrometer," 51st AIAA/ASME/ASCE/AHS/ASC Conference on Structures, Structural Dynamics and Materials, Orlando, FL, Apr. 2010, AIAA Paper 2010-2935.
- Trottier, M., Baghal, L., Swenson, E., Black, J., and C. Finley, "Accurate Dynamic Response Predictions of Various Plug- and- Play SAT I Configurations," 51st AIAA/ASME/ASCE/AHS/ASC Conference on Structures, Structural Dynamics and Materials, Orlando, FL, Apr. 2010, AIAA Paper 2010-2958.
- Jameson, M., Rogers, D., Allen, C., Blandino, J., Jennings, A., Magree, D., Pollock, S., and Black, J., "Motion Capture and Photogrammetry System Hybridization for Dynamic In-Flight Tracking and Measurement", 1st National Society of Black Engineers Aerospace Systems Conference, Feb. 2010, Conference Best Paper.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Awarded AIAA Associate Fellow.

Executive Committee Member of the Ohio Space Grant Consortium (OSGC) representing AFIT.

35th AIAA Dayton-Cincinnati Aerospace Sciences Symposium (DCASS) Technical Chair.

Treasurer, Dayton-Cincinnati Section, American Institute of Aeronautics and Astronautics (AIAA).

AIAA Journal Reviewer.

AIAA Journal of Aircraft Reviewer.

AIAA Journal of Spacecraft and Rockets Reviewer.

Shock and Vibration Reviewer.

International Micro Air Vehicle Journal Reviewer.

Session co-chair at 51st AIAA/ASME/ASCE/AHS/ASC Conference on Structures, Structural Dynamics and Materials, Orlando, FL, Apr. 2010.

AIAA Abstract Reviewer, 51st SDM Conference, 2010.

AIAA Structural Dynamics Technical Committee Member.

AIAA Gossamer Spacecraft Program Committee Member.

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 supercritical 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

SPONSOR FUNDED RESEARCH PROJECTS

"Air Force Institute of Technology Space and Rocket Propulsion Research." Sponsor: AFRL/RZ. Funding: \$75,000.

"Ultra Compact Combustor Cavity-Vane Interactions." Sponsor: AFOSR. Funding: \$43,834.

"Investigation of Cavity-Vane Interaction in an Ultra Compact Combustor." Sponsor: AFOSR. Funding: \$30,000.

REFEREED JOURNAL PUBLICATIONS

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.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Dayton-Cincinnati Aerospace Sciences Symposium Corporate Exhibit Chair.

Promoted to Associate Fellow in AIAA.

COBB, RICHARD G.,

Associate 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

SPONSOR FUNDED RESEARCH PROJECTS

“Planning, Guidance, and Control for Multiple UAV Cooperative Operations.” Sponsor: AFRL/RB.
Funding: \$5,000. [ANT]

“CubeSat Capabilities Study.” Sponsor: N/A. Funding: \$110,000. [ANT]

“Collaborative Control for Multiple UAV Operations.” Sponsor: AFRL/RB. Funding: \$20,000. [ANT]

“Dynamic Optimization for Rapid Route Planning and Analysis.” Sponsor: USSTRATCOM. Funding: \$100,000.

“Hyperactive Fin.” Sponsor: AFTPS. Funding: \$48,000.

REFEREED JOURNAL PUBLICATIONS

Colombi, J., and Cobb, R., “Application of Systems Engineering to Rapid Prototyping for Close Air Support,” *Defense Acquisition Review Journal*, Edition 52, pp. 284-303, October 2009.

Cobb, R., Black, J. and Swenson, E., “Design and Flight Qualification of the Rigidizable Inflatable Get-Away-Special Experiment,” *AIAA Journal of Spacecraft and Rockets*, Vol 47, No 4, pp. 659-699, July-August 2010.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Trottier, M., Baghal, L., Swenson, E., Black, J., Finley, C., and Cobb, R., “Accurate Dynamic Response Predictions of Various Plug-and-Play SAT I Configurations,” 51st AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, 18th AIAA/ASME/AHS, 12th Adaptive Structures Conference, Orlando, Florida, Apr. 12-15, 2010, AIAA Paper 2010-2958.

Miller, S., Book, T., Morse, A., Swenson, E., Cobb, R., Black, J., Hartsfield, C., “Structural Design and Analysis of a Novel Space-Based Chromotomographic Spectrometer,” 51st AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, 18th AIAA/ASME/AHS, 12th Adaptive Structures Conference, Orlando, Florida, Apr. 12-15, 2010, AIAA Paper 2010-2935.

Thomas, G., Swenson, P., Cobb, R., Swenson, E. and Black, J., “Prototype Development and Dynamic Characterization of Deployable CubeSat Booms,” 51st AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, 18th AIAA/ASME/AHS, 12th Adaptive Structures Conference, Orlando, Florida, Apr. 12-15, 2010, AIAA Paper 2010-2907.

Swenson, P., Thomas, G., Cobb, R., Black, J. and Swenson, E., "Development and Design of an AFIT CubeSat Demonstrating Deployable Technology," 51st AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, 18th AIAA/ASME/AHS, 12th Adaptive Structures Conference, Orlando, Florida, Apr. 12-15, 2010, AIAA Paper 2010-2906.

Norris, A., Palazotto, A. and Cobb, R., "Structural Dynamic Characterization of an Insect Wing," 51st AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, 18th AIAA/ASME/AHS, 12th Adaptive Structures Conference, Orlando, Florida, Apr. 12-15, 2010, AIAA Paper 2010-2790.

Anderson, M. and Cobb, R., "Frequency Response of a Micro Air Vehicle Wing Flapping Mechanism to Non-Harmonic Forcing," 51st AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, 18th AIAA/ASME/AHS, 12th Adaptive Structures Conference, Orlando, Florida, Apr. 12-15, 2010, AIAA Paper 2010-2708.

Swenson, E., Black, J. and Cobb, R., "Investigating the Effects of Orthogonalization of Measured Modes on Finite Element Model Tuning," 51st AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, 18th AIAA/ASME/AHS, 12th Adaptive Structures Conference, Orlando, Florida, Apr. 12-15, 2010, AIAA Paper 2010-2546.

O'Dell, D., Bostick, R., Hawks, M., Swenson, E., Black, J. Cobb, R. and Perram, G., "Chromotomographic Imager Field Demonstration Results", Airborne Intelligence, Surveillance, Reconnaissance (ISR) Systems and Applications VI, Orlando, Florida, 7 April 2010, Proc. SPIE, Vol. 7668, 766804 (2010); doi:10.1117/12.849702.

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

SPONSOR FUNDED RESEARCH PROJECTS

"Research in Control of Isolator Shock Train." Sponsor: AFRL/RZ. Funding: \$27,000.

"Space Proximity Operations." Sponsor: AFRL/RZ. Funding: \$10,000.

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

SPONSOR FUNDED RESEARCH PROJECTS

“Reusable Launch Vehicle Flight Aerodynamics with High Fidelity Hypersonic Flowfield Solvers.” Sponsor: AFRL/RB. Funding: \$20,000.

“Improved Collision Modeling for Direct Simulation Monte Carlo Methods.” Sponsor: AFOSR. Funding: \$18,526.

“Development of Coupled Flowfield- Radiation Solution Methods in Ablative Environments.” Sponsor: AFOSR. Funding: \$22,615.

REFEREED JOURNAL PUBLICATIONS

Bentley, B.I. and Greendyke, R.B., “Entropy-Shock Interactions Using the Unified Flow Solver (UFS),” *Journal of Thermophysics and Heat Transfer*, Vol. 24, No. 4, Oct-Dec 2010.

Weaver, A.B., Alexeenko, A.A., Greendyke, R.B., Camberos, J.A., “Flowfield Uncertainty Analysis for Hypersonic CFD Simulations,” *Journal of Thermophysics and Heat Transfer*. Vol. 24, No. 4, Oct-Dec 2010.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Greendyke, R.B. and Summers, S. E., “A Smoothed Accept-Reject Algorithm for Collisional Modeling in DSMC,” 10th AIAA/ASME Joint Thermophysics and Heat Transfer Conference, Chicago, IL, June 2010.

Martin, C.L. and Greendyke, R.B., “Two-Temperature vs. Multi-Species, Multi-Temperature Thermal Modeling Techniques in Nonequilibrium Radiating Shock Layers,” Dayton-Cincinnati Aerospace Sciences Symposium, March 2010.

Weaver, A., Alexeenko, A., Greendyke, R., and Camberos, J., “Flowfield Uncertainty Analysis for Hypersonic CFD Simulations,” AIAA Paper 2010-1180, Orlando, FL, January 2010.

Callaway, D., Reeder, M., and Greendyke, R., “Photogrammetric Measurement of Recession Rates of Low Temperature Ablators in Supersonic Flow,” AIAA Paper 2010-1216, Orlando, FL, January 2010.

Martin, C.L. and Greendyke, R.B., “A Comparative Analysis of Two-Temperature vs. Multi-Species, Multi-Temperature Thermal Modeling Techniques in Radiating Shock Layers,” AIAA Paper 2010-0235. Orlando, FL, January 2010.

HARMON, FREDERICK G., Lt Col,

Assistant Professor of Aeronautical Engineering, Department of Aeronautics and Astronautics, AFIT
Appointment Date: 2008 (AFIT/ENY); 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, nonlinear control, robotics, hybrid-electric propulsion systems, 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

SPONSOR FUNDED RESEARCH PROJECTS

“Design of a Parallel Hybrid-Electric Propulsion System for a Small Unmanned Aircraft System.” Sponsor: AFRL/RZ. Funding: \$5,000.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Hiserote, R., Harmon, F., *Analysis of Hybrid-Electric Propulsion Systems for Small Unmanned Aircraft Systems*, AIAA-2010-6687, AIAA's 8th International Energy Conversion Engineering Conference, Nashville, TN, July 25-28, 2010.

Hrad, P., Harmon, F., *Conceptual Design Tool for Hybrid-Electric Fuel Cell Powered MAV Propulsion*, AIAA-2010-6688-, AIAA's 8th International Energy Conversion Engineering Conference, Nashville, TN, July 25-28, 2010.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Elected to the Faculty Council, military member, for academic year, 2010-2011.

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

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

Assistant Professor of Aerospace Engineering and Deputy Head, 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

SPONSOR FUNDED RESEARCH PROJECTS

"Plasma Actuator Diagnostic Development." Sponsor: AFOSR. Funding: \$41,852.

"Gravity Gradiometry Instrument (GGI) Algorithm Development." Sponsor: AFRL/RV. Funding: \$15,000.

"Directed Energy Weapon Collateral Effects." Sponsor: AFRL/RD. Funding: \$10,000.

"Aircraft Survivability." Sponsor: USSTRATCOM. Funding: \$25,000.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

AIAA 10-1713. US Air Force T&E Days, Feb 2010. Chesterman, M., and Huffman, R., "Collateral Damage Effects of Directed Energy Weapons."

AIAA 10-0783. 48th AIAA Aerospace Sciences Meeting and Exhibit, Jan 2010. Huffman, R., and Elliott, G., "The Effect of Plasma on the Flow Features of an Axisymmetric Jet."

35th AIAA Dayton-Cincinnati Aerospace Symposium, Mar 2010. Stults, J. and Huffman, R., "A Comparison of Forward Models for Microwave Plasma Diagnostics."

2010 Joint Navigation Conference, Jun 2010. DeGregoria, A. and Huffman, R., "Gravity Gradiometry and Map Matching: An Aid to Aircraft Inertial Navigation Systems."

2010 Threat Weapons Effects Symposium, Apr 2010. Sims, T. and Huffman, R. "Guns, Bullets and Ballistics."

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Deployed in support of Operation Enduring Freedom as Commander, Detachment 7, 602d Training Group (Provisional) located at Camp Atterbury, IN and Fort Bliss TX.

Displays Committee Chair for the 35th AIAA Dayton-Cincinnati Aerospace Symposium, Mar 2010.

Session Chair for the 35th AIAA Dayton-Cincinnati Aerospace Symposium, Mar 2010.

Nominated for Associate Fellow of the American Institute of Aeronautics and Astronautics.

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

SPONSOR FUNDED RESEARCH PROJECTS

"Pulsed Detonation Propulsion Research." Sponsor: AFRL/RZ. Funding: \$5,000.

"Optimization of a High-Pressure Turbine Inlet Vane for Increased Performance and Extended Durability." Sponsor: AFRL/RZ. Funding: \$5,000.

REFEREED JOURNAL PUBLICATIONS

Hopper, D.R., King, P.I., Hoke, J.L., Paxon, D.E. and Schauer, F.R., "Detonation Initiation and Propagation in a Branched Detonation PDE," JANNAF Jnl Propulsion and Energetics, V. 3, N.1, May 2010, pp. 55-69.

Rutledge, J.L., King, P.I. and Rivir, R.B., "Net Heat Flux Reduction for Unsteady Film Cooling," ASME Journal of Engineering for Gas Turbines and Power, Vol.132, No. 12, August 2010.

Doster, J.L., King, P.I., Gruber, M.R. and Maple, R.C., "Numerical Simulation of Ethylene Injection from In-stream Fueling Pylons," AIAA Journal of Propulsion and Power, Feb 2010.

Doster, J.L., King, P.I. and Gruber, M.R., "Experimental Investigation of Air and Methane Injection from In-stream Fueling Pylons," AIAA Journal of Propulsion and Power, Feb 2010.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Wilson, C.W., King, P.I., Hoke, J.L. and Schauer, F.R., "The Effects of Varied Octane Rating on a Small Spark Ignition Internal Combustion Engine," AAIA- 2010-0150, 48th AIAA Aerospace Sci. Meeting and Exhibit, Orlando, FL, 4-7 Jan 2010.

Fievisohn, R.T., King, P.I., Schauer, F.R., Hoke, J.L. and Katta, V.R., "Numerical Investigation of Pre-detonators for Pulse Detonation Engines," AAIA- 2010-0150, 48th AIAA Aerospace Sci. Meeting and Exhibit, Orlando, FL, 4-7 Jan 2010.

Rouser, K.P., King, P.I., Schauer, F.R. and Hoke, J.L., "Unsteady Performance of a Turbine Driven by a Pulse Detonation Engine," AAIA- 2010-1116, 48th AIAA Aerospace Sci. Meeting and Exhibit, Orlando, FL, 4-7 Jan 2010.

Stevens, C.A., King, P.I., Schauer, F.R. and Hoke, J.L., "Effects of a Catalyst Coating on a PDE Endothermic Fuel Heating System," AAIA- 2010-0147, 48th AIAA Aerospace Sci. Meeting and Exhibit, Orlando, FL, 4-7 Jan 2010.

Carroll, D.R., King, P.I. and Rutledge, J.L., "Flow Visualization Study of Passive Flow Control Features on a Film-Cooled Turbine Blade Leading Edge," GT2010-23179, Proceedings ASME Turbo Expo 2010, June 14-18, 2010, Glasgow, Scotland, UK.

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

SPONSOR FUNDED RESEARCH PROJECTS

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

"Structural Dynamics of Membrane Structures Using Hamilton's Weak Principle." Sponsor: AFOSR.
Funding: \$27,533.

REFEREED JOURNAL PUBLICATIONS

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

Askey, S.A. and Kunz, D.L., "Investigation of the Benefits and Effectiveness of Hamilton's Weak Principle for Multibody Systems Analysis," AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics and Materials Conference, Orlando, Florida, April 2010.

Boston, J.D., Swenson, E.D., Kunz, D.L., Yu, W., and Blair, M., "Experiments with Geometric Non-linear Coupling for Analytical Validation," AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics and Materials Conference, Orlando, Florida, April 2010.

Hainge, A.D. and Kunz, D.L., "Demonstration of a Multibody Analysis Program Based on Direct Solutions from Hamilton's Law," AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics and Materials Conference, Orlando, Florida, April 2010.

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

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

SPONSOR FUNDED RESEARCH PROJECTS

"Nonequilibrium Gas Flows Using the Unified Flow Solver (UFS)." Sponsor: AFOSR. Funding: \$18,670.

"Non-Repeatability of Store Separation through Unsteady Flow." Sponsor: AFSEO. Funding: \$12,080.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Kraft, N.C. and Lofthouse, A.J., "Non-Repeatability of 2D Store Separation Trajectories from Internal Weapons Bays due to Unsteady Cavity Flow Effects," AIAA Aerospace Sciences Conference, Orlando, FL, January 2010.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Dayton-Cincinnati Aerospace Sciences Session Chair.

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

SPONSOR FUNDED RESEARCH PROJECTS

"Carbon Nanotubes Based on Nanocomposites and Nanoadhesives for EMI/ESD Applications in Space Structures." Sponsor: AS&T. Funding: \$86,785.

"Characterization of Ceramics Matrix Composite in Gas Turbine Engine Environments." Sponsor: AFRL/RX. Funding: \$60,000.

“Improved Electromagnetic Hardening of Coax Cables and Composites Using Advanced Nanomaterials.”
Sponsor: DAGSI. Funding: \$20,160.

REFEREED JOURNAL PUBLICATIONS

Ahn, J-M. and Mall, S., “Frequency Effects on Fatigue Behavior of Silicon Carbide Fiber Reinforced Glass-Ceramic Composite (SiC/MAS),” *International Journal of Applied Ceramic Technology*, Vol. 6, pp. 45-52, 2009.

Yang, B., Rethinam, R. M. and Mall, S., “Modeling and Analysis of Cylindrical Nanoindentation of Graphite,” *Journal of Applied Mechanics*, Vol. 76, 011010-1 – 011010-7, 2009.

Mall, S. and Conley, D. S., “Modeling and Validation of Composite Patch Repair to Cracked Thick and Thin Metallic Panels,” *Composites Part A*, Vol. 40, 1331-1339, 2009.

Mall, S., Katwyk, D. W., Bolick, R. L., Kelkar, A. D. and Davis, D. C. “Tension-Compression Fatigue Behavior of a H-VARTM Manufactured Unnotched and Notched Carbon/Epoxy Composite,” *Composite Structures*, Vol. 90, pp. 201-207, 2009.

Magaziner, R. S., Jain V. K. and Mall, S., “Investigation into Wear of Ti-6Al-4V under Reciprocating Sliding Conditions,” *Wear*, Vol. 267, 368-373, 2009.

Sabelkin, V. and Mall, S., “Combined Adhesion and Friction Effects on Cylinder-on-Flat Elastic-Plastic Microcontact,” *Journal of Adhesion Science and Technology*, Vol. 23, 851-879, 2009.

Kim, T. T., Mall, S. and L. P. Zawada, “Fatigue Characterization of a Melt-Infiltrated Woven Hi-NiC-SiC/SiBN/SiC Ceramic Matrix Composite using a Unique Combustion Test Facility,” *Ceramic Transactions*, Vol. 179, 103-116, 2009.

Mall, S., Ouper, B. L., Fielding, J. C., “Compression Strength Degradation of Nanocomposites after Lightning Strike,” *Journal of Composite Materials*, Vol. 43, 2987-3001, 2009.

Lee, H., Mall, S. and Sayoma, H., “Fretting Fatigue Behavior of Cavitation Shotless Peened Ti-6Al-4V,” *Tribology Letters*, Vol. 36, 89-94, 2009.

Mall, S. and M. A. Sullivan, “Tension-Tension Fatigue Behavior of Notched Nextel 720/Alumina (N720/A) at Elevated Temperature,” *Journal of Science and Engineering of Composite Materials*, Vol. 16, 235-245, 2009.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Mall, S. and Nye, A. R., “Fatigue Behavior of an Oxide/Oxide CMC under Combustion Environment,” 35th International Conference & Exposition on Advanced Ceramics & Composites, Daytona Beach, January 24-29, 2010.

Mall, S. “Electrically Conductive Nanocomposites for Structural Applications,” *Proceedings of the International Conference on “Nanomaterials: Synthesis, Characterization and Applications (ICN-2010),” April 27- 30, 2010 at Mahatma Gandhi University, Kottayam, India (INVITED TALK).*

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 Hetenyi 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

SPONSOR FUNDED RESEARCH PROJECTS

"Structural Dynamic Characterization of a Biologically Inspired Micro Air Vehicle Wing." Sponsor: AFOSR. Funding: \$37,677.

"High Temperature Coating Evaluation." Sponsor: AFRL/RZ. Funding: \$23,000.

"Evaluation of Nonlinear Movement in Micro Air Vehicles." Sponsor: AFRL/RB. Funding: \$20,000.

"Extreme Wear-Resistant Materials." Sponsor: AFOSR. Funding: \$50,000.

"Evaluation of Bio-Inspired Micro Air Vehicle." Sponsor: AFRL/RB. Funding: \$25,000.

REFEREED JOURNAL PUBLICATIONS

Abu Al-Rub, R., and Palazotto, A., "Micromechanical Theoretical and Computational Modeling of Energy Dissipation due to Nonlinear Vibration of Hard Ceramic Coatings With Microstructural Recursive Faults" Int. J. of Solids and Structures, Vol. 47, pp. 2131-2142, 2010.

Larson, R., and Palazotto, A., "Property Estimation in FGM Plates Subjected to Low Velocity Impact Loading." J. of Mechanics of Materials and Structures, Vol. 4, Nos. 7-8, pp. 1429-1451, 2009.

Deliktas, B., Voyiadjis, G., and Palazotto, A., "Simulation of Perforation and Penetration in Metal Matrix Composite Materials Using a Coupled Viscoplastic Damage Model, Composite: Part B. pp. 434-442, 2009.

Voyiadjis, G., Deliktas, B., and Palazotto, A., "Thermodynamically Consistent Coupled Viscoplastic Model for Perforation and Penetration in Metal Matrix Compositemicromechanics Materials," Composite, Part B, pp. 427-433, 2009.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Abu Al-Rub, R. and Palazotto, A., "Two -Scale Computational Modeling of Fatigue Damage of Hard Ceramic Coatings with Microstructural Recursive Faults," presented at the 2009 ASME Intl. Mechanical Engineering Congress and Exposition, Lake Buena Vista, Florida, November, 13-19, 2009.

Palazotto, A., "Research as Related to High Velocity Wear," presented as an invited paper at the Test and Evaluation Conference, Nashville, Tennessee, February, 2, 2010.

Palazotto, A., "Bio-inspired MAV Research," presented at the MAV workshop, Dayton, Ohio, February, 18, 2010.

Paek, G., Baker, W., and Palazotto, A., "Surface Temperature and Melt Profile Due to Frictional Heating," presented at the Dayton-Cincinnati Aerospace Science Symposium, Dayton, Ohio, March 9, 2010.

- Easterday, O., Palazotto, A., Branam, R., and Baker, W., “Characterization of Thermal Barrier Coatings at Elevated temperature in a Free-Free System,” presented at the Dayton-Cincinnati Aerospace Science Symposium, Dayton, Ohio, March 9, 2010.
- O’Hara, R., and Palazotto, A., “Material Property Characterization of *Manduca sexta* Forewing’, presented at the Dayton-Cincinnati Aerospace Science Symposium, Dayton, Ohio, March 9, 2010.
- Sabat, J., and Palazotto, A., “Structural Consideration for the Slotted Waveguide Assembly Stiffened Structure in Compression,” presented at the Dayton-Cincinnati Aerospace Science Symposium, Dayton, Ohio, March 9, 2010.
- Sims, T., and Palazotto, A., “ A Structural Dynamic Analysis of a *Manduca sexta* Forewing,” presented at the Dayton-Cincinnati Aerospace Science Symposium, Dayton, Ohio, March 9, 2010.
- Tubbs, T., and Palazotto, A., “Flapping Motion of *Manduca sexta*,” presented at the Dayton-Cincinnati Aerospace Science Symposium, Dayton, Ohio, March 9, 2010.
- Meador, S., and Palazotto, A., “ Consideration of Wear at High Velocities,” presented at the Dayton-Cincinnati Aerospace Science Symposium, Dayton, Ohio, March 9, 2010.
- Pai, F. and Palazotto, A., “Advanced time Frequency Analysis for Characterization of Nonlinear Structural Vibrations,” presented at the 51st AIAA SDM Conference, Orlando, Florida, April, 12-15, 2010, paper # 2010-2639.
- Norris, A., Palazotto, A., and Cobb, R., “ Structural Dynamic Characterization of an Insect Wing,” presented at the 51st AIAA SDM Conference, Orlando, Florida, April, 12-15, 2010, paper # 2010-2790.
- Sabat, J., and Palazotto, A., “Structural Performance of Composite Material for a Slotted Waveguide Antenna,” presented at the 51st AIAA SDM Conference, Orlando, Florida, April, 12- 5, 2010, paper # 2010-2945.
- Abu Al-Rub, R., Palazotto. “ Mesoscale Energy Dissipation Prediction in Thermal Barrier Ceramic Coatings Under Nonlinear Vibration,” presented at the 51st AIAA SDM Conference, Orlando, Florida, April, 12-15, 2010, paper # 2010-3125.
- Easterday, O., Palazotto, A., Branam, R., and Baker, W., “ An Unique Experimental Device for Evaluating Damping Properties of Thermal Barrier Coatings at Elevated Temperatures, presented at the 51st AIAA SDM Conference, Orlando, Florida, April, 12-15, 2010, paper # 2010-31265.

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. 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

SPONSOR FUNDED RESEARCH PROJECTS

“Flow Migration in an Ultra Compact Combustor.” Sponsor: AFOSR. Funding: \$29,500.

“AFIT Combustion Laboratory Program Concerning UCC and Small Engine Combustion Phenomena.”
Sponsor: AFRL/RZ. Funding: \$30,000.

REFEREED JOURNAL PUBLICATIONS

Anderson, W., Polanka, M., Zelina, J., Evans, D., Stouffer, S.D., and Justinger, Garth R., “Effects of a Reacting Cross-Stream on Turbine Film Cooling,” ASME Paper GT-2009-59242. *Journal of Engineering for Gas Turbines and Power*, Vol. 132, May 2010, 051501-1:7.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

LeBay, K.D, Drenth, A.C., Thomas, L.M., Polanka, M.D., Branam, R.D., and Schmidt, J.B., “Characterizing the Effects of G-Loading in an Ultra Compact Combustor via Sectional Models,” ASME Paper GT-2010-22723, IGTI Turbo Expo, Glasgow, UK, Jun 14-18, 2010.

Sanders, D.D., O’Brien, W.F., Sondergaard, R., Polanka, M.D., Rabe, D.C., “Unsteady Wake Effects on a Highly Loaded Low Pressure Turbine Blade - Part II: Prediction of Separation and Transitional Flow” ASME Paper GT-2010-22991, IGTI Turbo Expo, Glasgow, UK, Jun 14-18, 2010.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Vanguard Chair for the Heat Transfer Committee of the International Gas Turbine Institute Turbo Expo ’10, in Glasgow, Scotland June 14-18, 2010.

Chair for the Dayton-Cincinnati Section of AIAA.

Honors and Awards Chair for the Dayton-Cincinnati Section of AIAA.

Charles P. Brothers Award for Outstanding Volunteer Service – AFIT, 2010.

AIAA Outstanding Section Award, Very Large Category, 2nd Place, 2010.

AIAA Career and Workforce Development Award, Very Large Category, 1st Place, 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. 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, Experiments in Fluids, 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

SPONSOR FUNDED RESEARCH PROJECTS

“Design and Testing of Flapping-Wing Micro Air Vehicles.” Sponsor: AFRL/RB. Funding: \$60,000.

“Instruction on Fluids Experimentation.” Sponsor: AFRL/RB. Funding: \$22,940.

“Implementing Dry Ice Particle Seeding in the Trisonic Gasdynamics Facility.” Sponsor: AFRL/RB.
Funding: \$10,000

“Experimental Study of Free-drop Store Separation from a Cavity at Mach 3.” Sponsor: AFRL/RB.
Funding: \$2,000.

REFEREED JOURNAL PUBLICATIONS

Reeder, M., Crafton, J., Estevadeordal, J., DeLapp, C.J., McNiel, C., Peltier, D., & Reynolds, T., “Clean seeding for flow visualization and velocimetry measurements,” *Experiments in Fluids*, Vol. 48, No. 5, pp. 889-900, May 2010.

Williams, M., Reeder, M., Maple, R., and Solfelt, D., “Modeling, Simulation, and Flight Tests for a T-38 Talon with Wing Fences,” *AIAA Journal of Aircraft*, Vol. 47, No. 2, pp. 423-433, March 2010.

Black, J.T., Pitcher, N.A., Reeder, M.F., and R.C. Maple, “Videogrammetry Dynamics Measurements of a Lightweight Flexible Wing in a Wind Tunnel,” *AIAA Journal of Aircraft*, Vol. 47, No.1, pp. 172-180, January 2010.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Kenneth LeBay, Terry Hankins, Patrick Lakusta, Richard Branam, Mark Reeder, Stanislav Kostka, “OH-PLIF Calibration and Investigation Within the Ultra Compact Combustor,” AIAA-2010-1330, 48th AIAA Aerospace Sciences Meeting, Orlando, Florida, Jan. 4-7, 2010.

David Callaway, Mark Reeder, Robert Greendyke, Ryan Gosse, “Photogrammetric Measurement of Recession Rates of Low Temperature Ablators in Supersonic Flow,” AIAA-2010-1216, 48th AIAA Aerospace Sciences Meeting, Orlando, Florida, Jan. 4-7, 2010.

Brian Love, Mark Reeder, “Particle Size Control for PIV Seeding Using Dry Ice,” AIAA-2010-1033, 48th AIAA Aerospace Sciences Meeting, Orlando, Florida, Jan. 4-7, 2010.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Serving as Editor-in-Chief for the International Journal of Micro Air Vehicles (IJMAV, Multi-Science Publishing).

Presented a talk entitled, “Low Temperature Ablator Tests on Dry Ice,” at the 3rd Annual AFOSR/NASA/SNL Ablation Workshop in Austin, TX.

Member of the Aerodynamic Measurements Technology (AMT) Committee for AIAA.

Served as Session Chair at the AIAA Meeting (Orlando, FL, January 2010).

Served as a referee for one paper submitted to Experiments in Fluids.

Served as referee for two papers submitted to the AIAA Journal of Aircraft.

Served as an evaluator for two Army Research Office Proposals.

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 90 journal articles and technical reports, and has co-authored 7 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 and is a member of the ASME PVPD Executive 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

SPONSOR FUNDED RESEARCH PROJECTS

“Mechanical Behavior of Advanced SiC/SiC Composites at Elevated Temperatures in Air and In Steam.”
Sponsor: DAGSI. Funding: \$20,160.

“Creep of Polycrystalline Yttrium Aluminum Garnet in Combustion Environments (Steam).” Sponsor:
AFRL/RX. Funding: \$20,000.

“Extension of the Viscoplasticity Theory Based on Overstress to Model Effects of Aging on Deformation Behavior of High-Temperature Polymers.” Sponsor: AFOSR. Funding: \$43,070.

“Coordination and Supplementation of Modeling and Experimental Data.” Sponsor: AFRL/RX. Funding: \$80,000.

REFEREED JOURNAL PUBLICATIONS

M. B. Ruggles-Wrenn and T. Kutsal, “Effects of Steam Environment on Creep Behavior of Nextel™720/Alumina-Mullite Ceramic Composite at Elevated Temperature,” *Composites Part A: Applied Science and Manufacturing*, in press, available on journal website 18 September 2010.

M. B. Ruggles-Wrenn and V. Sharma, “Effects of Steam Environment on Fatigue Behavior of Two SiC/[SiC+Si₃N₄] Ceramic Composites at 1300 °C,” *Applied Composite Materials*, in press, available on journal website 2 September 2010.

M. B. Ruggles-Wrenn and O. Ozmen, “The Rate (Time) – Dependent Mechanical Behavior of the PMR-15 Thermoset Polymer at 316 °C: Experiments and Modeling,” *Journal of Pressure Vessel Technology, Transactions ASME*, Vol. 132, No. 4, August 2010, pp. 041403-1 - 041403-6.

M. B. Ruggles-Wrenn and M. Ozer, “Creep Behavior of Nextel™720/Alumina-Mullite Ceramic Composite with ±45° Fiber Orientation at 1200 °C,” *Materials Science and Engineering A*, Vol. 527, 2010, pp. 5326-5334.

M. B. Ruggles-Wrenn, T. Yeleser, G. E. Fair and J. B. Davis, “Effects of Steam Environment on Creep Behavior of Nextel™610/Monazite/Alumina Composite at 1100 °C,” *Applied Composite Materials*, Vol. 16, No. 6, 2009, pp. 379-392.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

M. B. Ruggles-Wrenn, D. T. Christensen, A. Chamberlain, J. Lane, T. Cook “Effect of Steam Environment on Fatigue Behavior of an Advanced SiC/SiC Ceramic Matrix Composite at 1200 °C,” *Proceedings of the 7th International Conference on High Temperature Ceramic Matrix Composites (HT-CMC7)*, Bayreuth, Germany, September 20–22, 2010, pp. 358-364.

M. Ozer and M. B. Ruggles-Wrenn, “Effects of Environment on Creep Behavior of Nextel™720/Alumina-Mullite Ceramic Composite with $\pm 45^\circ$ Fiber Orientation at 1200 °C,” *Proceedings of the 34th International Conference & Exposition on Advanced Ceramics & Composites*, Daytona Beach FL, January 24–29, 2010.

M. B. Ruggles-Wrenn, “Effects of Temperature and Environment on Creep Behavior of two Oxide-Oxide Ceramic Matrix Composites,” *Proceedings of the Materials Science & Technology 2009 Conference and Exhibition*, Pittsburgh PA, October 25-29, 2009.

M. B. Ruggles-Wrenn, “Cyclic Creep and Recovery Behavior of Nextel™720/Alumina Ceramic Composite at 1200 °C,” *Proceedings of the 34th International Conference & Exposition on Advanced Ceramics & Composites*, Daytona Beach FL, January 24–29, 2010.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Member, Executive Committee, Pressure Vessels and Piping Division, American Society of Mechanical Engineers. 2010-present.

Chair, Professional Development, Pressure Vessels and Piping Division, American Society of Mechanical Engineers. 2010-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.

Design & Analysis Track Organizer, ASME 2010 Pressure Vessel and Piping Conference, July 2010.

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. Lt Col 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

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: \$20,000.

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

SWENSON, ERIC D., Lt Col,

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. Eric 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 senior member of
AIAA and a member of Chi Epsilon, SPIE, and Tau Beta Pi. Tel. 937-255-3636 x4628 (DSN 785-3636
x4628), email: Eric.Swenson@afit.edu.

SPONSOR FUNDED RESEARCH PROJECTS

"State-of-the-Art Measurements of Lamb Waves in Realistic Structures for SHM." Sponsor: AFRL/RB.
Funding: \$25,000.

"Experimental Validation of the Geometrically-Exact Beam Theory (GEBT)." Sponsor: AFRL/RB.
Funding: \$9,000.

"Development and Validation of Geometrically-Exact Beam Theory (GEBT) and Variational Asymptotic
Beam Sectional (VABS)." Sponsor: AFRL/RB. Funding: \$27,000.

REFEREED JOURNAL PUBLICATIONS

Swenson, E.D. and Soni S., "Damage Detection in a Geometrically Constrained Area," *Journal of Structural
Longevity*, 2010.

Johnston, J. and Swenson, E.D., "Feasibility Study of GPS-based Aircraft Carrier Flight Deck Persistent
Monitoring System," *AIAA Journal of Aircraft*, 2010.

Cobb, R., Black, J., and E. Swenson, "Design and Flight Qualification of the Rigidizable Inflatable Get-
Away-Special Experiment," *Journal of Spacecraft and Rockets*, 2010.

Cobb, R., Black, J., and E. Swenson, "Rigidizable Inflatable Get-Away-Special Experiment," *Journal of
Spacecraft and Rockets*, 2010.

Swenson, E.D. and Black, J.T., "Optimal Finite Element Model Tuning," *Journal of Experimental
Mechanics*, 2010.

REFEREED CONFERENCE PUBLICATIONS BASED ON ABSTRACT REVIEW

Book, T.A., Starr, W., Morse, A., Black, J.T., Swenson, E.D., and Cobb, R.G. "A Design Overview of a
Space-Based Chromotomographic Hyperspectral Imaging Experiment," *In proceedings 24th Annual
AIAA/USU Conference on Small Satellites, (Paper Submitted)*, Logan, UT, 9-12 Aug. 2010.

- Starr, W., Book, T.A., Morse, A., Miller, S., Black, J.T., Swenson, E.D., and Cobb, R.G., "The Analysis and Design of the Target Acquisition/Tracking for a Space-Based Chromotomographic Hyperspectral Imaging Experiment on the Japanese Experimental Module," *In proceedings of AIAA/AAS Astrodynamics Specialist Conference, (Paper Submitted)*, Aug. 2010.
- Swenson, E.D., Olson, S.E., DeSimio, M.P., and Sohn, H., "Analysis of Lamb Wave Interaction with Corrosion Damage in Aluminum Plates," *In the Proceedings of the 5th Edition of the European Workshop on Structural Health Monitoring, (Paper Submitted)* Naples-Italy, Jul. 2010.
- Sohn, H., Dutta, D., Yang, J.Y., DeSimio, M.P., Olson, S.E. and Swenson, E.D., "A Wavefield Imaging Technique for Delamination Detection in Composite Structures," *In the Proceedings of the 5th Edition of the European Workshop on Structural Health Monitoring, (Paper Submitted)* Naples-Italy, Jul. 2010.
- Olson, S.E., DeSimio, M.P., Swenson, E.D., and Sohn, H., "Interaction of Lamb Waves with Structural Features of an Aircraft Fuselage," *In the Proceedings of the 5th Edition of the European Workshop on Structural Health Monitoring, (Paper Submitted)* Naples-Italy, Jul. 2010.
- Sohn, H., Yang, J.Y., Dutta, D., DeSimio, M.P., Olson, S.E. and Swenson, E.D., "Imaging Ultrasonic Waves in Complex Structures Using a Scanning Laser Doppler Vibrometer," *Proceedings of 5th International Conference on Bridge Maintenance, Safety and Management, (Paper Submitted)* Philadelphia, PA, Jul. 2010.
- Boston J., Swenson, E., Kunz D., Yu, W., Blair, M., "Experiments with Geometric Non-Linear Coupling for Analytical Validation," *Proceedings of 51st AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials*, Orlando, FL, Apr. 2010.
- Miller, S. D., Book, T. A., Morse, A. L., Swenson, E. D., Cobb, R. G., and Black, J. T., "Structural Design and Analysis of a Novel Space-Based Chromotomographic Spectrometer," *Proceedings of 51st AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials*, Orlando, FL, Apr. 2010.
- Swenson, E.D., Black, J.T., and Cobb, R.G., "Correcting the Effects of Orthogonalizing Measured Modes When Tuning Finite Element Models," *51st AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials*, Orlando, FL, Apr. 2010.
- Trottier, M., Baghal, L., Swenson, E.D., Black, J.T., and Finley C., "Accurate Dynamic Response Predictions of Various Plug-and-Play SAT I Configurations," *Proceedings of 51st AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials*, Orlando, FL, Apr. 2010.
- Thomas, G.M., Swenson, P.J., Black, J.T., Cobb, R.G., Swenson, E.D., "Mission Analysis and Design of an AFIT CubeSat," *Proceedings of 51st AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials*, Orlando, FL, Apr. 2010.
- Swenson, P.J., Thomas, G.M., Black, J.T., Cobb, R.G., and Swenson, E.D., "Ground Deployment Testing of a One Meter Reflector from and AFIT CubeSat," *Proceedings of 51st AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials*, Orlando, FL, Apr. 2010.
- O'Dell, D., Hawks, M., Swenson, E., Black, J., Cobb, R., and Perram, G., "Chromotomographic Imager Field Demonstration Results," *Proceedings of SPIE Defense, Security, and Sensing Conference Proceedings*, Orlando, FL, Apr. 2010.
- Sohn, H., Swenson, E., Olson, S., and DeSimio, M., "Delamination Detection in Composite Plates using Laser Vibrometry Measurements of Lamb Waves," *Proceedings of SPIE's 17th International Symposium on Smart Structures and Materials*, San Diego, CA, Mar. 2010.

Olson, S., Sohn, H., Swenson, E., and DeSimio, M., "Computational Lamb Wave Model Validation Using 1D and 3D Laser Vibrometer Measurements," *Proceedings of SPIE's 17th International Symposium on Smart Structures and Materials*, San Diego, CA, Mar. 2010.

Swenson, E., Sohn, H., Olson, S., and DeSimio, M., "Comparison of 1D and 3D Laser Vibrometry Measurements of Lamb Waves," *Proceedings of SPIE's 17th International Symposium on Smart Structures and Materials*, San Diego, CA, Mar. 2010.

Swenson, E., Soni, S., and Kapoor, H., "Lamb Wave Propagation in Z-pin Reinforced, Co-cured Composite Pi-Joints," *Proceedings of SPIE's 17th International Symposium on Smart Structures and Materials*, San Diego, CA, Mar. 2010.

Swenson, E., Kapoor, H., and Soni, S., "Effects of Z-Pins on Composite Plates," *Proceedings of SPIE's 17th International Symposium on Smart Structures and Materials*, San Diego, CA, Mar. 2010.

Baghal, L., Eric Swenson, E.D., and Finley, C., "Application of Lessons Learned from Traditional Satellite Assembly, Integration, and Test for Operationally Responsive Satellites," *Proceedings of Responsive Space 8 Conference*, Long Beach, CA, Mar. 2010.

Baghal, L., Eric Swenson, E.D., and Finley, C., "Streamlining System Level Test for Responsive Spacecraft," *Proceedings of Responsive Space 8 Conference*, Long Beach, CA, Mar. 2010.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Promoted to Senior Member in AIAA.

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 ASEE. 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

REFEREED JOURNAL PUBLICATIONS

Torvik, P. J., "A Slip Damping Model for Plasma Sprayed Ceramics," *Journal of Applied Mechanics*, Vol. 76, No. 6. November 2009.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Torvik, P. J., "Damping Properties of Hard Coatings for Engine Applications," *Advances in Science and Technology*, Trans Tech Publications, Vol. 66, pp. 126-135, 2010. (Invited paper from 12th International Ceramics Conference, Montecatini, Italy, June 6-11, 2010.

Filippi, S and P. J. Torvik, "A Methodology for Predicting the Response of Blades with Non-linear Coatings," *Proceedings: ASME Turbo Expo 2010: GT 2010-22090*, June 2010.

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, with the third edition appearing this year.. He has authored over 40 technical papers and has been a member of the department for 34 years. Tel. 937-255-3636 x4312 (DSN 785-3636 x4312), email: William.Wiesel@afit.edu

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Wiesel, W. E., "Earth Satellite Perturbation Theories as Approximate KAM Tori," paper AAS 10-152, 20th AAS/AIAA Spaceflight Mechanics Meeting, San Diego, CA, 14-17 February 2010, also proceedings *Advances in the Astronautical Sciences*, v 136.

Craft, Christopher, and Wiesel, W.E. "Formation Flight of Earth Satellites on KAM Tori," paper AAS 10-157, 20th AAS/AIAA Spaceflight Mechanics Meeting, San Diego, CA, 14-17 February 2010, also proceedings *Advances in the Astronautical Sciences*, v 136.

BOOKS AND CHAPTERS IN BOOKS

Wiesel, W.E. "*Spaceflight Dynamics* Third Edition," CreateSpace, ISBN 978-1452879598, 358 pp., 2010.

Wiesel, W.E. "*Modern Astrodynamics*, Second Edition," CreateSpace ISBN 9781453781470, 210 pp., 2010.

Wiesel, W.E., "*Modern Orbit Determination*, Second Edition," CreateSpace ISBN 978-1453611982, 148 pp., 2010.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Dr. Wiesel serves as the Secretary of the Honors Seminars of Metropolitan Dayton, Inc, as a member of the board. He has also been active for several decades in giving talks to students in this program.

5.2. DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

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5.2.1. DOCTORAL DISSERTATIONS

BIRRER, BOBBY D., *Developing a Qualia-Based Multi-Agent Architecture for Use in Malware Detection*. AFIT/DCS/ENG/10-01. Faculty Advisor: Dr. Richard A. Raines. Sponsor: AFRL/R.Y.

COMPTON, MATTHEW D., *Improving the Quality of Service and Security of Military Networks with a Network Tasking Order Process*. AFIT/DCS/ENG/10-09. Faculty Advisor: Dr. Kenneth M. Hopkinson. Sponsor: AFRL/RI.

DIXON, DONALD B., *Statistical Image Recovery From Laser Speckle Patterns With Polarization Diversity*. AFIT/DEO/ENG/10-11. Faculty Advisor: Dr. Stephen C. Cain. Sponsor: AFRL/RD.

HODSON, DOUGLAS D., *Performance Analysis of Live-Virtual-Constructive and Distributed Virtual Simulations: Defining Requirements in Terms of Temporal Consistency*. AFIT/DCE/ENG/09-25. Faculty Advisor: Dr. Rusty Baldwin. Sponsor: ASC/XRA-SIMAF.

HOOPER, DAYLOND J., *Coalition Formation under Uncertainty*. AFIT/DEE/ENG/10-05. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: AFRL/R.Y.

HYDE, MILO W., IV., *Determining the Index of Refraction of an Unknown Object Using Passive Polarimetric Imagery Degraded by Atmospheric Turbulence*. AFIT/DEE/ENG/10-12. Faculty Advisor: Maj Jason D. Schmidt. Sponsor: AFOSR.

KARRELS, DANIEL R., *Large-Scale Distributed Coalition Formation*. AFIT/DCE/ENG/09-11. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: AFRL/RI.

LACEY, TIMOTHY H., *Reputation-Based Internet Protocol Security: A Multilayer Security Framework for Mobile Ad Hoc Networks*. AFIT/DCS/ENG/10-07. Faculty Advisor: Dr. Robert F. Mills. Sponsor: N/A.

LARSON, CRAIG D., *An Integrity Framework for Image-Based Navigation Systems*. AFIT/DEE/ENG/10-03. Faculty Advisor: Dr. John R. Raquet. Sponsor: AFRL/R.Y.

LIKE, ERIC C., *Spectrally-Temporally Adapted Spectrally Modulated Spectrally Encoded (SMSE) Waveform Design for Coexistent CR-Based SDR Applications*. AFIT/DEE/ENG/10-04. Faculty Advisor: Dr. Michael A. Temple. Sponsor: Laboratory for Telecommunications Sciences.

McGUIRK, JEFFREY S., *Electromagnetic Field Control and Optimization Using Metamaterials*. AFIT/DEE/ENG/09-13. Faculty Advisor: Dr. Peter J. Collins. Sponsor: National RCS Test Facility.

McMAHON, JASON R., *Improving Range Estimation of a 3D FLASH LADAR via Blind Deconvolution*. AFIT/DEE/ENG/10-13. Faculty Advisor: Dr. Richard K. Martin. Sponsor: AFOSR.

NUNEZ, ABEL S., *A Physical Model of Human Skin and Its Application for Search and Rescue*. AFIT/DEO/ENG/09-14. Faculty Advisor: Maj Michael J. Mendenhall. Sponsor: AFRL/R.Y.

5.2.2. MASTER'S THESES

ALLEN, CHRISTOPHER I., *Effects of Channel Mismatches on Beamforming and Signal Detection*. AFIT/GE/ENG/10-01. Faculty Advisor: Dr. Richard K. Martin. Sponsor: AFRL/R.Y.

ANILAO, JENNIFER C., *Utilizing the Digital Fingerprint Method for Secure Key Generation*. AFIT/GE/ENG/10-02. Faculty Advisor: Dr. Yong C. Kim. Sponsor: AFRL/R.Y.

ARMSTRONG, ANDREW M., *A Security Assessment of Modern Smart Cards under Differential Power Analysis Attacks Using a Field Programmable Gate Way Implementation of a Side Channel Analysis Test Platform*. AFIT/GCE/ENG/10-01. Faculty Advisor: Lt Col Jeffrey W. Humphries. Sponsor: N/A.

ARRIAGADA, MANUEL E., *Performance of Scattering Matrix Decomposition and Color Spaces for Synthetic Aperture Radar Imagery*. AFIT/GE/ENG/10-03. Faculty Advisor: Maj Michael A. Saville. Sponsor: AFRL/RV.

BAI, WILLIAM T., *Development of a Methodology for Customizing Insider Threat Auditing on a Linux Operating System*. AFIT/GCO/ENG/10-01. Faculty Advisor: Dr. Robert F. Mills. Sponsor: NSA.

BARNARD, CURTIS P., *Hijacking User Uploads to Online Persistent Data Repositories for Covert Data Exfiltration*. AFIT/GCO/ENG/10-16. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: IOG/DD.

BEHRING, ADAM J., *Applying Image Matching to Video Analysis*. AFIT/GCE/ENG/10-072. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: AFRL/RI.

BIRCH, SAMUEL W., *Performance Characteristics of a Kernel-Space Packet Capture Module*. AFIT/GCO/ENG/10-03. Faculty Advisor: Dr. Robert F. Mills. Sponsor: 90 IOS/TA.

BOROWSKI, JOHN F., *Reputation-Based Trust for a Cooperative, Agent-Based Backup Protection Scheme for Power Networks*. AFIT/GCO/ENG/10-04. Faculty Advisor: Dr. Kenneth M. Hopkinson. Sponsor: AFRL/RI.

BRADY, STEVEN H., *Frequency Diverse Array Radar: Signal Characterization and Measurement Accuracy*. AFIT/GE/ENG/10-04. Faculty Advisor: Maj Michael A. Saville. Sponsor: AFRL/RV.

BROOKS, ADAM L., *Improved Multispectral Skin Detection and its Application to Search Space Reduction for Dismount Detection Based on Histograms of Oriented Gradients*. AFIT/GE/ENG/10-05. Faculty Advisor: Maj Michael J. Mendenhall. Sponsor: 711 HPW/RH.

CADY, CAMDON R., *Static and Dynamic Component Obfuscation on Reconfigurable Devices*. AFIT/GE/ENG/10-06. Faculty Advisor: Dr. Yong C. Kim. Sponsor: AFOSR/RS.

CLAGNAZ, JOHN J., *U. S. Cyber Command – Cyberspace Superiority in the 21st Century*. AFIT/GCO/ENG/10-05. Faculty Advisor: Dr. Robert F. Mills. Sponsor: N/A.

DEAS, BRIAN T., *Pulse Shape Correlation for Laser Detection and Ranging (LADAR)*. AFIT/GE/ENG/10-07. Faculty Advisor: Dr. Stephen C. Cain. Sponsor: N/A.

DELL'ACCIO, PETER J., *Visually Managing IPsec*. AFIT/GCO/ENG/10-06. Faculty Advisor: Lt Col Stuart H. Kurkowski. Sponsor: N/A.

DODGE, DUSTYN A., *Cyber Situational Awareness Using Live Hypervisor-Based Virtual Machine Introspection*. AFIT/GCE/ENG/10-07. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: AFRL/RI.

ERSKINE, JOSEPH R., *Developing Cyberspace Data Understanding: Using CRISP-DM for Host-based IDS Feature Mining*. AFIT/GCS/ENG/10-01. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: AFOSR/RS.

ESTEP, NICHOLAS A., *High Power Microwave (HPM) and Ionizing Radiation Effects on CMOS Devices*. AFIT/GE/ENG/10-08. Faculty Advisor: Dr. Andrew J. Terzuoli. Sponsor: AFRL/RD.

FRANCIK, PETER R., *Analysis of a Rumor Routing Protocol with Limited Packet Lifetimes*. AFIT/GE/ENG/10-09. Faculty Advisor: Dr. Rusty O. Baldwin. Sponsor: N/A.

FRITTS, NICHOLAS E., *A Distributed Network Logging Topology*. AFIT/GCO/ENG/10-07. Faculty Advisor: Lt Col Brett J. Borghetti. Sponsor: N/A.

GROSS, AARON A., *Handshaking Protocols and Jamming Mechanisms for Blind Rendezvous in a Dynamic Spectrum Access Environment*. AFIT/GCO/ENG/10-09. Faculty Advisor: Maj Ryan A. Thomas. Sponsor: AFRL/RV.

GUNN, WILLIAM E., JR., *Application of the Three Short Calibration Technique in a Low Frequency Focus Beam System*. AFIT/GE/ENG/10-10. Faculty Advisor: Dr. Michael J. Havrilla. Sponsor: AFRL/RV.

HANINGTON, ERIC C., *A Comparative Analysis of ASCII and XML Logging Systems*. AFIT/GCO/ENG/10-17. Faculty Advisor: Dr. Rusty O. Baldwin. Sponsor: NSA.

HAWKER, TRAVIS J., *Cyberspace Mission Focus: NW Ops vs. NetOps*. AFIT/ICW/ENG/10-03. Faculty Advisor: Dr. Robert F. Mills. Sponsor: NASIC.

HINSON, JOSEPH M., *Code White: A Signed Code Protection Mechanism for Smartphones*. AFIT/GCO/ENG/10-10. Faculty Advisor: Dr. Rusty O. Baldwin. Sponsor: N/A.

HIRSCHFELD, MITCHELL D.I., *An Application of Automated Theorem Provers To Computer System Security: The Schematic Protection Model*. AFIT/GCO/ENG/10-18. Faculty Advisor: Dr. Rusty O. Baldwin. Sponsor: NASIC.

HOMUNG, MATTHEW P., *Flexible Computing Architecture for Real Time Skin Detection*. AFIT/GCE/ENG/10-02. Faculty Advisor: Maj Michael J. Mendenhall. Sponsor: 711 HPW/RH.

HUBER, DEREK J., *Attaining Realistic Simulations of Mobile Ad-hoc NETWORKS*. AFIT/GCO/ENG/10-11. Faculty Advisor: Maj Mark D. Silvius. Sponsor: N/A.

HURLIMAN, MORGAN L., *An Assessment of Target to Ground Interactions for Radar Cross Section Measurements*. AFIT/GE/ENG/10-11. Faculty Advisor: Dr. Peter J. Collins. Sponsor: AFRL/RV.

ISALY, LAURA A., *Augmenting Latent Dirichlet Allocation and Rank Threshold Detection with Ontologies*. AFIT/GCS/ENG/10-03. Faculty Advisor: Maj Eric D. Trias. Sponsor: JIEDDO.

KORANEK, DANIEL F., *Deterministic, Efficient Variation of Circuit Components to Improve Resistance to Reverse Engineering*. AFIT/GCO/ENG/10-15. Faculty Advisor: Dr. Yong C. Kim. Sponsor: AFOSR/NL.

KOVACH, NICHOLAS S., *Accelerating Malware Detection via a Graphics Processing Unit*. AFIT/GCO/ENG/10-12. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: AFSPC.

KWAK, HYON H., *Toward A Mobile Agent Relay Network*. AFIT/GCS/ENG/10-04. Faculty Advisor: Lt Col Brett J. Borghetti. Sponsor: N/A.

LAKE, ROBERT A., *Integrated Microelectromechanical Systems (MEMS) Based Safe and Arming Devices for Airborne Munitions*. AFIT/GE/ENG/10-12. Faculty Advisor: Maj Lavern A. Starman. Sponsor: AFRL/RW.

LeBLANC, KEVIN R., *Satellite-Based Fusion of Imaging Sensors and Georegistered Map Data for Precise Geolocation and Target Tracking*. AFIT/GE/ENG/10-13. Faculty Advisor: Lt Col Michael J. Veth. Sponsor: Ball Aerospace and Technologies Corporation.

LONG, IV., LESTER C., *An Approach to Large Scale Radar-Based Modeling and Simulation*. AFIT/GE/ENG/10-14. Faculty Advisor: Maj Michael A. Saville. Sponsor: AFRL/RV.

LUNDELL, CHRISTOPHER A., *Characterization and Measurement of Passive and Active Metamaterial Devices*. AFIT/GE/ENG/10-15. Faculty Advisor: Dr. Peter J. Collins. Sponsor: AFRL/RX.

LUPIEN, NICHOLAS A., *Scalable and Fault Tolerant Group Key Management*. AFIT/GCS/ENG/10-05. Faculty Advisor: Dr. Kenneth M. Hopkinson. Sponsor: AFRL/RI.

MASSMAN, JEFFREY P., *Artificial Inhomogeneous Tapered Impedance Sheet Characterization and Applications*. AFIT/GE/ENG/10-16. Faculty Advisor: Dr. Michael J. Havrilla. Sponsor: AFRL/Ry.

MAYO, KENNETH W., *Multi-Objective Constraint Satisfaction for Mobile Robot Area Defense*. AFIT/GCE/ENG/10-03. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: AFRL/Ry.

McGINTHY, JASON M., *Global Navigation Satellite System Software Defined Radio*. AFIT/GE/ENG/10-17. Faculty Advisor: Dr. John F. Raquet. Sponsor: GPSW/EN.

McGOWAN, JOHN E., *The Effect of Synthetic Aperture Radar Image Resolution on Target Discrimination*. AFIT/GE/ENG/10-18. Faculty Advisor: Dr. Andrew J. Terzuoli. Sponsor: AFRL/Ry & NASIC.

MENDEZLLOVET, EDDIE A., *Codifying Information Assurance Controls for Department of Defense (DOD) Supervisory Control and Data Acquisition (SCADA) Systems (U)*. AFIT/GCO/ENG/10-13. Faculty Advisor: Lt Col Jeffrey W. Humphries. Sponsor: AFCESA/CC.

MILLER, COREY M., *Evolutionary Artificial Neural Network Weight Tuning to Optimize Decision Making for an Abstract Game*. AFIT/GCS/ENG/10-06. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: AFRL/Ry.

MUNNS, SHELDON A., *Spectral Domain RF Fingerprinting for 802.11 Wireless Devices*. AFIT/GE/ENG/10-19. Faculty Advisor: Dr. Michael A. Temple. Sponsor: AFRL/Ry.

MUTLU, YASIN A., *Aiding GPS with Additional Satellite Navigation Services*. AFIT/GSS/ENG/10-01. Faculty Advisor: Lt Col Michael J. Stepaniak. Sponsor: AFRL/Ry.

NABER, NATHAN P., *Real Time Fault Detection and Diagnostics Using FPGA-Based Architecture*. AFIT/GCE/ENG/10-04. Faculty Advisor: Dr. Yong C. Kim. Sponsor: AFRL/Ry.

NAKATA, ADAM L., *Temperature Detection Using Digital Fingerprinting*. AFIT/GE/ENG/10-20. Faculty Advisor: Dr. Yong C. Kim. Sponsor: AFRL/Ry.

NELMS, MATTHEW E., *Development and Evaluation of a Multistatic Ultrawideband Random Noise Radar*. AFIT/GE/ENG/10-21. Faculty Advisor: Dr. Peter J. Collins. Sponsor: AFRL/Ry.

PARHAM, JAMES D., *Component Hiding Using Identification and Boundary Blurring Techniques*. AFIT/GE/ENG/10-22. Faculty Advisor: Lt Col Jeffrey T. McDonald. Sponsor: AFOSR/RS.

PELLIZZARI, CASEY J., *Phase Unwrapping in the Presence of Strong Turbulence*. AFIT/GE/ENG/10-23. Faculty Advisor: Maj Jason D. Schmidt. Sponsor: AFOSR/NE.

PESKOSKY, KEITH R., *Design of a Monocular Multi-Spectral Skin Detection, Melanin Estimation, and False-Alarm Suppression System*. AFIT/GE/ENG/10-24. Faculty Advisor: Maj Michael J. Mendenhall. Sponsor: 711 HPW/RH.

PUGH, STEVEN M., *Investigating the Use of Frequency Selective Surfaces in High Power Microwave Applications*. AFIT/GE/ENG/10-25. Faculty Advisor: Dr. Michael J. Havrilla. Sponsor: N/A.

ROMAN, CALVIN T., *Investigation of Thermal Management and Metamaterials*. AFIT/GE/ENG/10-26. Faculty Advisor: Maj Lavern A. Starman. Sponsor: AFRL/RX.

ROWELL, CHARLES R., JR., *Modeling Computer Communication Networks in a Realistic 3D Environment*. AFIT/GCE/ENG/10-05. Faculty Advisor: Lt Col Stuart Kurkowski. Sponsor: AFOSR/RSL.

SLAMAN, DANIEL R., *Side Channel Analysis Countermeasures via Obfuscated Bytecode Instruction Sets*. AFIT/GE/ENG/10-27. Faculty Advisor: Dr. Yong C. Kim. Sponsor: AFOSR/RS.

SMITH, NINA R., *Increasing the Sensitivity of Surface Acoustic Wave (SAW) Chemical Sensors and other Chemical Sensing Investigations*. AFIT/GE/ENG/10-28. Faculty Advisor: Dr. Ronald A. Coutu. Sponsor: AFRL/RX.

STACKHOUSE, MICHAEL J., *Nanoporous Energetic Silicon-Based Anti-Tamper Response*. AFIT/GE/ENG/10-29. Faculty Advisor: Maj Lavern A. Starman. Sponsor: AFRL/RX.

STEWART, KYLE E., *Designing a Hybrid Virtualization Platform Design for Cyber Warfare and Simulation*. AFIT/GCE/ENG/10-06. Faculty Advisor: Lt Col Jeffrey W. Humphries. Sponsor: N/A.

THOMAS, BRENNON D., *Performance Evaluation of a Field Programmable Gate Array-Based System for Detecting and Tracking Peer-to-Peer Protocols on a Gigabit Ethernet Network*. AFIT/GCO/ENG/10-20. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: AFSPC.

VOETBERG, BENJAMIN J., *Feature Characterization of Related Stimulus-Response Pulses from Digital Systems*. AFIT/GE/ENG/10-30. Faculty Advisor: Dr. Michael A. Temple. Sponsor: AFRL/RX.

WEISSGERBER, KURT, *Developing an Effective and Efficient Real Time Strategy Agent for Use as a Computer Generated Force*. AFIT/GCS/ENG/10-07. Faculty Advisor: Lt Col Brett J. Borghetti. Sponsor: N/A.

YATES, DON J., *Monocular Vision Localization Using A Gimbaled Laser Range Sensor*. AFIT/GE/ENG/10-31. Faculty Advisor: Lt Col Michael J. Veth. Sponsor: N/A.

5.2.3. GRADUATE RESEARCH PAPERS

BEACH, MATTHEW G., *Managing Cyber Operator Training Curriculum*. AFIT/ICW/ENG/10-01. Faculty Advisor: Dr. Robert F. Mills. Sponsor: N/A.

CASEY, BRENDAN K., *Policy Changes for Acquisition of Offensive Cyber Systems*. AFIT/ICW/ENG 10-02. Faculty Advisor: Dr. Robert F. Mills. Sponsor: 950 ELSG/NW.

PEREZ, DAVID D., *Cyberspace Dependence in Air Force Flying Squadrons and its Effect on Mission Assurance*. AFIT/ICW/ENG/10-04. Faculty Advisor: Dr. Robert F. Mills. Sponsor: HQ USAF/A30-CF.

5.2.4. FACULTY RESEARCH OUTPUT

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

AKERS, GEOFFREY A., Maj,

Assistant Professor 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; PhD, University of Kansas. 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

SPONSOR FUNDED RESEARCH PROJECTS

“Radio Frequency Waveform Exploitation.” Sponsor: NSA. Funding: \$50,000. [CCR]

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

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Fadul, J.E., Hopkinson, K.M., Andel, T.R., Kurkowski, S., Moore, J.T., Simple Trust Protocol for Wired and Wireless SCADA Networks, *International Conference on Information Warfare and Security (ICIW)*, 8-9 April 2010, Wright-Patterson AFB, OH, USA, pp. 89-97.

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

SPONSOR FUNDED RESEARCH PROJECTS

“Autonomic and Cryptographic (ATSPI) Kernel Software Protection System.” Sponsor: AFRL/RV. Funding: \$80,000. [CCR]

“Tactical SIGINT Technology Program.” Sponsor: NSA. Funding: \$511,000. [CCR]

“Scalable Wireless Airborne Network Security.” Sponsor: AFRL/RI. Funding: \$50,000. [CCR]

“688th Information Operations Wing Technical Support Proposal.” Sponsor: 688 IOW. Funding: \$75,000. [CCR]

“Technical Support, Air and Cyberspace Analysis.” Sponsor: NASIC. Funding: \$12,000. [CCR]

SPONSOR FUNDED EDUCATIONAL PROJECTS

“Federal Cyber Service: Scholarship for Service (SFS).” Sponsor: NSF. Funding: \$222,804. [CCR]

REFEREED JOURNAL PUBLICATIONS

- 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*, Vol. 3, No. 3, pp. 350-368, June 2010.
- 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*, Vol. 30, No. 2, pp. TBD, June 2010.
- D. D. Hodson and R. O. Baldwin, "Characterizing, Measuring, and Validating the Temporal Consistency of Live-Virtual-Constructive Environments" *Simulation: Transactions of the Society for Modeling and Simulation International*, October 2009, Vol. 85, No. 10, pp. 671-682.

PATENTS

- W. Kimball and R. O. Baldwin, "Emulation-Based Software Protection," Provisional Patent, 4 December 2009.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Reviewer for National Science Foundation.

MILCOM 2010 – Technical Panel Committee for Networking Protocols and Performance Track.

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

SPONSOR FUNDED RESEARCH PROJECTS

"Artificial Intelligent Agents for City Beat Program." Sponsor: AFRL/RH. Funding: \$231,763.

REFEREED JOURNAL PUBLICATIONS

- Brett Borghetti, "The Environment-Value of an Opponent Model, *IEEE Transactions on Systems, Man and Cybernetics* part B, special edition on game theory," Volume 40 No. 3, pp. 623-633, June 2010.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

- Hyon Kwak and Brett Borghetti, "Reducing Communication Detection and Eavesdropping using Mobile Agent Relay Networks," *Winter Simulation Conference 2010*, Invited Paper, June 2010.
- Ryan W. Thomas, Ramakant S. Komali, Brett Borghetti and Petri Mahonen, "A Bayesian Game Analysis of Emulation Attacks in Dynamic Spectrum Access Networks," in *Proc of IEEE DySPAN 2010*, April 2010.
- Kurt Weissgerber, Brett Borghetti, and Gilbert Peterson, "An Effective and Efficient Real Time Strategy Agent," *Florida Artificial Intelligence Research Society Conference*, May 2010.
- Daylond Hooper, Gilbert Peterson, Brett Borghetti, "Dynamic Coalition Formation Under Uncertainty," *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, October 2009. [ANT]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Program Committee/Reviewer: Autonomous Agents and Multi Agent Systems Conference 2010.

Reviewer: AFOSR Young Investigator Proposal Award.

Reviewer: IEEE Transactions on Systems, Man, and Cybernetics Journal 2010.

Reviewer: IEEE International Conference on Communications (ICC) Wireless and Mobile Networking Symposium 2010.

Air University Information Technology Working Group.

Air University Learning and Information Technology Corporate Structure Board.

BUTTS, JONATHAN W., Capt,

Assistant Professor of Computer Engineering, Department of Electrical and Computer Engineering, AFIT
Appointment Date: 2010 (AFIT/ENG); BS, Computer Science, Chapman University, 2001; MS, Information Assurance, Air Force Institute of Technology, 2006; PhD, Computer Science, University of Tulsa, 2010. His research interests include critical infrastructure protection, information assurance, SCADA and telecommunication systems security, operationalizing military actions in cyberspace and the science of cyber. Tel. 937-255-3636 x4332 (DSN 785-3636x4332), email: jonathan.butts@afit.edu

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

SPONSOR FUNDED RESEARCH PROJECTS

“Advances in Polarimetric Blind Deconvolution.” Sponsor: AFRL/RD. Funding: \$20,000.

“Inverse Polarimetric Synthetic Aperture LADAR Power Requirements.” Sponsor: AFRL/RV. Funding: \$25,000.

REFEREED JOURNAL PUBLICATIONS

Milo Hyde, Stephen Cain, Jason Schmidt and Michael Havrilla, "Material Classification of an Unknown Object Using Turbulence-Degraded Polarimetric Imagery", IEEE Transactions on Geoscience and Remote Sensing, Vol. PP, 1-13, August 2010.

Jason R. McMahon, Richard K. Martin, and Stephen C. Cain, “Three-dimensional FLASH laser radar range estimation via blind deconvolution,” J. Appl. Remote Sens., Vol. 4, 043517, March 2010.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Stephen C. Cain, “Anomaly detection using range profile and intensity signatures,” Active and Passive Signatures, Orlando FL, April 2010.

BOOKS AND CHAPTERS IN BOOKS

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

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

SPONSOR FUNDED RESEARCH PROJECTS

“Enabling Technologies for Radar Scattering Measurements.” Sponsor: AFRL/RX. Funding: \$100,000.

“RF/Optical/Thermal Metamaterials Research.” Sponsor: AFRL/RX. Funding: \$108,051.

“Field Emission Technology Investigations.” Sponsor: SAF. Funding: \$150,000.

REFEREED JOURNAL PUBLICATIONS

McGuirk, J.S., Collins, P.J., Havrilla, M.J., and Wood, A.W., “A Green’s Function Approach to Calculate Scattering Width for Cylindrical Cloaks,” *Journal of the Applied Computational Electromagnetics Society*, Vol.25, No. 2, 2010.

R. J. Barton, P. J. Collins, P. E. Crittenden, M. J. Havrilla, A. J. Terzuoli, “Analytical Development of the Far Zone Radiation Integral for an Arbitrary Planar Spiral Antenna,” *IEEE Magazine, Antennas, and Propagation*, Vol 52, No 2, April 2010.

Crossley, B.L., Kossler, M., Coutu, Jr., R.A., Starman, L.A. and Collins, P.J., “Effects of Hydrogen Pretreatment on Physical-Vapor-Deposited Nickel Catalyst for Multi-Walled Carbon Nanotube Growth,” *Journal of Nanophotonics Letters*, Vol. 4, 049502:1-6, 2010.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Lundell, C.A., Collins, P.J, Coutu, Jr., R.A. and Starman, L.A., “RF Characterization and Testing of Adaptive RF Metamaterial Structure Using MEMS,” *The 11th International Symposium on MEMS and Nanotechnology, SEM Annual Conference*, IN, 7-9 June 2010.

D. Langley, R.A. Coutu, Jr., L.A. Starman, P.J. Collins, “MEMS Integrated Metamaterial Structure Having Variable Resonance for RF Applications,” *The 11th International Symposium on MEMS and Nanotechnology, SEM Annual Conference*, IN, 7-9 June 2010.

Crossley B.L., Coutu, Jr., R.A., Starman, L.A. and Collins, P.J., “Characterization of an Optimized Carbon Nanotube Field Emission Array,” *The 11th International Symposium on MEMS and Nanotechnology, SEM Annual Conference*, IN, 7-9 June 2010.

A. Schmitt, P. J. Collins, S. K. Rogers, A. J. Terzuoli, Jr., “Noise Radar Correlation Patterns of Human And Non-Human Objects At Various Look Angles,” *31st Annual AMTA Symposium Proceedings*, Salt Lake City UT, 1-6 November 2009.

Keichel, W., Collins, P.J., Havrilla, M., Saville, M., “Two Dimensional Scattering Analysis of Data-Linked Support Strings for Bistatic Measurement Systems,” *Proceedings of the Antenna Measurement Techniques Association 31st Annual Symposium*, Salt Lake City, UT, 1-6 November 2009.

Crossley B.L., Kossler, M., Coutu, Jr., R.A., Starman, L.A. and Collins, P.J., “Optimization of Carbon Nanotube Field Emission Arrays,” *Proceedings of the COMSOL conference*, MA, 8-10 October 2009.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

“RF MTM Characterization Research at the Air Force Institute of Technology,” Invited keynote address to the Material Measurements Working Group Spring 2010 Meeting, hosted by the Air Force Research Laboratory, 5-6 May 2010.

Authored another significant update to “AFIT_process” (now called “ALPINE”) a comprehensive Matlab toolbox providing universal signal processing for all AFIT’s RF measurement facilities. Version 3.1 includes new advance image editing tools as well as data parsers for AFRL and NRTF range measurement data. Code has been distributed to the 781st TS, Holloman AFB, AFRL/RYS, and select individuals at the NRO.

COUTU, RONALD, A., Jr.,

Assistant Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT
Appointment Date: 24 August 2009 (AFIT/ENG); BSEE, University of Massachusetts, Amherst, 1993; MSEE, California Polytechnic (CalPoly) State University, San Luis Obispo, 1995; PhD, Air Force Institute of Technology, 2004. His research interests include microelectronics, microelectromechanical systems (MEMS) and nanotechnology with emphasis on metamaterials, micro-contacts, device reliability and carbon nanotubes. His areas of expertise include design, fabrication, and test of micro/nano devices. He is a member of Tau Beta Pi, Eta Kappa Nu and a Senior Member of IEEE. Tel. 937-255-3636 x7230 (DSN 785-3636 x7230), email: Ronald.Coutu@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

“RF/Optical/Thermal Metamaterials Research.” Sponsor: AFRL/RX. Funding: \$110,468.

“Electronic Component Failure Prediction Tool Development.” Sponsor: AS&T. Funding: \$45,000.

“Cleanroom Orientation/Usage.” Sponsor: AFRL/RX. Funding: \$42,000.

“Semiconductor Physics and Device Reliability.” Sponsor: AFRL/RX. Funding: \$30,000.

“MEMS Anti-Tamper Sensors.” Sponsor: AFRL/RX. Funding: \$100,000.

REFEREED JOURNAL PUBLICATIONS

Crossley, B.L., Kossler, M., Coutu, Jr., R.A., Starman, L.A. and Collins, P.J., “Effects of Hydrogen Pretreatment on Physical-Vapor-Deposited Nickel Catalyst for Multi-Walled Carbon Nanotube Growth,” Journal of Nanophotonics Letters, Vol. 4, 049502:1-6, 2010.

Wagner, T.J., Bohn, M.J., Coutu, Jr, R.A., Gonzalez, L.P., Murray, J.A., Schepler, K.L. and Guha S. “Modeling and dual pulse width measurement of mid-IR nonlinear absorption leading to damage in Ge and GaSb,” Journal of the Optical Society of America B, Vol 27, pp. 2122-2131, 2010.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Crossley B.L., Kossler, M., Coutu, Jr., R.A., Starman, L.A. and Collins, P.J., “Optimization of Carbon Nanotube Field Emission Arrays,” Proceedings of the COMSOL conference, MA, 8-10 October 2009.

Coutu, Jr., R.A., Edelman, T.A. and Starman, L.A., “Novel test fixture for collecting microswitch reliability data,” SPIE Photonics West Symposium, Reliability, Packaging, Testing, and Characterization of MEMS/MOEMS and Nanodevices IX conference, CA, 23-28 January 2010.

Langley, D., Coutu, Jr., R.A., and Starman, L.A., “Experimental investigation into metamaterial structures operating at infrared wavelength,” SPIE Photonics West Symposium, Reliability, Packaging, Testing, and Characterization of MEMS/MOEMS and Nanodevices IX conference, CA, 23-28 January 2010.

Crossley, B.L., Starman, L.A. and Coutu, Jr., R.A., "Self-assembling nanosphere lithography process for gated carbon-nanotube field emission arrays," SPIE Advanced Lithography Symposium, Alternative Lithographic Technologies conference, CA, 21-25 February 2010.

Lake, R.A., Coutu, Jr., R.A. and Starman, L.A., "Electrothermal Actuators for MEMS Safe and Arm Devices," The 11th International Symposium on MEMS and Nanotechnology, SEM Annual Conference, IN, 7-9 June 2010.

Roman, C.T., Starman, L.A. and Coutu, Jr., R.A., "Thermal Metamaterials," The 11th International Symposium on MEMS and Nanotechnology, SEM Annual Conference, IN, 7-9 June 2010.

Langley, D., Coutu, Jr., R.A. and Starman, L.A., "MEMS integrated metamaterial structure capable of variable resonance for RF applications," The 11th International Symposium on MEMS and Nanotechnology, SEM Annual Conference, IN, 7-9 June 2010.

Lundell, C.A., Paul, J.V, Collins, P.J, Coutu, Jr., R.A. and Starman, L.A., "RF testing of a MEMS integrated metamaterial structure capable of variable resonance," The 11th International Symposium on MEMS and Nanotechnology, SEM Annual Conference, IN, 7-9 June 2010.

Crossley B.L., Coutu, Jr., R.A., Starman, L.A. and Collins, P.J., "Characterization of an Optimized Carbon Nanotube Field Emission Array," The 11th International Symposium on MEMS and Nanotechnology, SEM Annual Conference, IN, 7-9 June 2010.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Proposal Reviewer, AFOSR/AOARD US-Korea Nano/Bio/Information Technology (NBIT) Phase II.

Technical Paper Reviewer, Institute of Physics.

Technical Paper Reviewer, Nanoscale Research Letters.

Technical Paper Reviewer, Tribology International Journal.

Technical Program Committee Member, IEEE Holm Conference on Electrical Contacts.

Session Chair, The 35th Annual AIAA Dayton-Cincinnati Aerospace Science Symposium.

Technical Paper Reviewer, The 56th IEEE Holm Conference on Electrical Contacts.

Technical Paper Reviewer, IEEE Transactions on Components and Packaging Technologies.

DAVIS, NATHANIEL J. IV,

Professor and Head, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2005 (AFIT/ENG), BSEE, Virginia Polytechnic Institute and State University, 1976, MSEE, Virginia Polytechnic Institute and State University, 1977, Ph.D. Purdue University, 1985. His research interests include computer communications networks, cyber operations, and large scale computer architectures. Dr. Davis is a senior member of the IEEE and a member of the Sigma Xi, Eta Kappa Nu, and Tau Beta Pi honorary societies. Tel. 937-255-3636 x7218 (DSN 785-3636 x7218), email: Nathaniel.Davis@afit.edu

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Law Offices of McDermott, Will, and Emery, Chicago, IL, September 2009-present. Conducting initial expert witness work in support of the patent infringement trial of Xpoint Technologies, Inc. v. Microsoft Corporation et.al. Retained by Qualcomm Inc., one of the defendants in the case. This patent infringement litigation deals with the design and use of peer-to-peer input/output circuits in computer systems. The case will be prosecuted in the United States District Court for the District of Delaware.

Law Offices of McDermott, Will, and Emery, Palo Alto, CA, February 2008 – present. Conducting initial expert witness work in support of the patent infringement trial of Enterasys Networks, Inc. v. Extreme Networks, Inc. Retained by Extreme Networks, the defendant in the case. This patent infringement litigation deals with the design and use of virtual private networks.

Selected by the IEEE as an ABET accreditation and assessment evaluator for electrical or computer engineering degree programs.

FISHER, KENNETH A., Maj,

Assistant Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT
Appointment Date: 2009 (AFIT/ENG), BSEE Ohio Northern University, 1997; MSEE, Air Force Institute of Technology, 1999; PhD, Air Force Institute of Technology, 2005. His research interests include stochastic estimation and control, information theory, navigation using signals of opportunity, and cooperative navigation. He is a member of ION, IEEE, Tau Beta Pi, and Eta Kappa Nu. Tel. 937-255-3636 x4677 (DSN 785-3636 x4677), email: Kenneth.Fisher@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

“Air-to-Air Missile Flight Path Reconstruction.” Sponsor: AFTPS. Funding: \$25,000. [ANT]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Paper reviewer for *IEEE Journal of Selected Topics in Signal Processing*.

Fisher, K. A., “USAF Air-Air and Air-Ground Operational Test and Evaluation Programs,” Monthly Meeting, Dayton Chapter of the Institute of Navigation, Hope Hotel, WPAFB, OH, March 2010. (30 engineers in attendance).

Served as Subject Matter Expert to DARPA on Sub-Surface Navigation Program and Robust Surface Navigation Program.

Member of Faculty Council Subcommittee on “Evaluating the Impact on AFIT of Ohio State Schools Going to a Semester-Based Academic Calendar.”

Guidance, Navigation, and Control Curriculum Chair.

Department of Electrical and Computer Engineering Admissions Reviewer for MS-level applicants.

GUSTAFSON, STEVEN C.,

Associate Professor of Electrical Engineering, Department of Electrical and Computer Engineering, (AFIT/ENG); AFIT Appointment date: 1998 (AFIT/ENG); BS, University of Minnesota, 1967; MS, Duke University, 1969; PhD, Duke University, 1974. Dr. Gustafson is an author of more than 200 publicly available technical papers, proceedings, and reports, most of which relate to optical processing and pattern recognition technology. He has been initiator and principal investigator on more than \$2 million in research contracts in these areas since 1990. Retired 2010.

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

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*, Vo. 22, pp. 31-45, January 2010.

M. A. Falknor, E. M. Guild, A. C. Hillier, E. C. Like, and S. C. Gustafson, “Direct Cardinal Interpolation,” *Electronic Journal of Applied Statistical Analysis*, May 2010.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

J. E. McGowan, S. C. Gustafson, J. A. Jackson, A. J. Terzuoli Jr., "The Effect of Synthetic Aperture Radar Image Resolution on Target Discrimination," SPIE Defense, Security, and Sensing Proceedings, Orlando, Florida, April 2010.

M.R. Falknor, E.M. Guild, and S. C. Gustafson, "How to Classify Signals," AFIT Technical Report AFIT/EN/TR-10-03, May 2010.

J. E. McGowan, S. C. Gustafson, J. A. Jackson, R. K. Martin, "Synthetic Aperture Radar Image Resolution Effect on Target Discrimination," ISPRS Commission VII Symposium, Vienna, Austria, July 2010.

J. E. McGowan, S. C. Gustafson, J. A. Jackson, R. K. Martin, "The Effect of Synthetic Aperture Radar Image Resolution on Target Discrimination," 38th COSPAR Scientific Assembly Proceedings, Bremen, Germany, July 2010.

Member, AFIT Automatic Target Recognition Working Group.

HAVRILLA, MICHAEL J.,

Associate Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT
Appointment Date: 2002 (AFIT/ENG); BS, Michigan State University, 1987, MSEE, Michigan State University, 1989, PhD, Michigan State University, 2001. His research interests include electromagnetics, guided wave theory and applications, material characterization, low observables, electromagnetic scattering and antenna theory. He is a member of HKN and Sigma Xi, Senior member of the IEEE, and a Full Member of the International Union of Radio Science-Commission B. Tel. 937-255-3636 x4582 (DSN 785-3636 x4582), email: Michael.Havrilla@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

"Electromagnetic Analysis and Design of Non-Destructive Evaluation Systems." Sponsor: AFRL/RX. Funding: \$71,000.

"Material Measurement Laboratory Research." Sponsor: AFRL/RX. Funding: \$68,000.

"Material Characterization of Complex Media." Sponsor: AFRL/RX. Funding: \$45,000.

REFEREED JOURNAL PUBLICATIONS

E. Rothwell, M. Havrilla and S. Dorey, "An improved physical-optics formulation for scattering by a thin resistive strip," Electromagnetics, vol. 30, no. 5, pp. 1-16, June/July 2010.

G. Dester, E. Rothwell and M. Havrilla, "An Extrapolation Method for Improving the Accuracy of Material Characterization using Waveguide Probes," IEEE Microwave and Components Letters, vol. 20, no. 5, pp. 298-300, May 2010.

J. McGuirk, P. Collins, M. Havrilla and A. Wood, "A Green's function approach to calculate scattering width for cylindrical cloaks," Applied Computational Electromagnetics Journal, vol. 25, no. 2, pp. 108-116, February 2010.

M. Hyde, J. Schmidt and M. Havrilla, "A Geometrical Optics Polarimetric Bidirectional Reflectance Distribution Function for Dielectric and Metallic Surfaces," Optics Express, vol. 17, no. 24, pp. 22138-22153, November 2009.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

M. Havrilla and M. Hyde, "Nondestructive clamped waveguide lowloss material extraction technique," Applied Computational Electromagnetics Society (ACES) Conference Proceedings, pp. 1-4, Tampere, Finland, April 2010.

J. Massman, M. Havrilla and K. Whites, "Adapting sheet impedance for electromagnetic compatibility," Asia Pacific Microwave Conference Proceedings, pp. 956-959, Singapore, December 2009.

W. Keichel, P. Collins, M. Havrilla and M. Saville, "Two dimensional scattering analysis of data-link support strings for bistatic measurement systems," Antenna Measurement Techniques Association (AMTA) Conference Proceedings, pp. 225-230, Salt Lake City, Utah, November 2009.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

"Dual-Probe Lowloss Material Extraction Techniques," at the Electromagnetic Theory Symposium, Berlin, Germany, August 2010.

Organizer-Host, Material Measurement Working Group Conference, Air Force Institute of Technology, May 2010.

Session Chair "Non-Destructive Evaluation and Material Characterization" for the Applied Computational Electromagnetics Conference, Tampere, Finland, April 2010.

Reviewer for the Journal of Electromagnetic Waves and Applications, November 2009.

Session Chair for the Antenna Measurement Techniques Association Conference, Salt Lake City, Utah, November 2009.

Technical Paper Reviewer, Antenna Measurement Techniques Association Conference, Salt Lake City, Utah, November 2009.

Member, Technical Review Committee for the Antenna Measurement Techniques Association Conference, Salt Lake City, Utah, November 2009.

HEMMES, JEFFREY M., Maj,

Assistant Professor of Computer Science, Department of Electrical and Computer Engineering, AFIT
Appointment Date: 2009 (AFIT/ENG), BS, Computer Science, Indiana University South Bend, 1997; MS, Computer Systems, Air Force Institute of Technology, 1999; PhD, University of Notre Dame, 2009. His research interests include modeling and simulation of mobile ad-hoc networks, distributed systems, and software engineering. Tel. 937-255-3636 X4619 (DSN 785-3636 x4619), email: Jeffrey.Hemmes@afit.edu

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

GCS Program Chair – conducted curriculum approval for GCS programs for the 2010 cycle.

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

SPONSOR FUNDED RESEARCH PROJECTS

“A Context-Aware Approach for Enabling Large-Scale Mobile Networks.” Sponsor: AFOSR. Funding: \$39,853. [ANT]

“A Context-Aware Middleware Architecture to Enable Large-Scale Networking.” Sponsor: AS&T. Funding: \$133,926.

“Airborne Networking: Using Context-Awareness for Better Network Routing and Management.” Sponsor: AFRL/RV. Funding: \$45,000.

“Enhancing Satellite Capabilities.” Sponsor: AS&T. Funding: \$100,000.

“HPC Summer Intern Support.” Sponsor: AFOSR. Funding: \$36,000.

“Technical Support: Cognitive and Mobile Networks.” Sponsor: AFRL/RI. Funding: \$75,000. [ANT]

“Technical Support: Experimental Layered Sensing Operations Center (LSOC), Simulation Interoperability.” Sponsor: AFRL/RV. Funding: \$40,000.

REFEREED JOURNAL PUBLICATIONS

Coates, G.M., Hopkinson, K.M., Graham, S.R., Kurkowski, S.H., A Trust System Architecture for SCADA Network Security, *IEEE Transactions on Power Delivery*, Volume 25, Issue 1, January 2010, pp. 158-169.

Hopkinson, K., Jenkins, K., Birman, K., Thorp, J., Toussaint, G., Parashar, M., Adaptive Gravitational Gossip: A Gossip-Based Communication Protocol with User-Selectable Rates, *IEEE Transactions on Parallel and Distributed Systems*, Volume 20, Issue 12, December 2009, pp. 1830-1843.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Dong, X.Y., Hopkinson, K.M., Tong, X.Y., Wang, X.R., Thorp, J., IP-Based Communication Systems for Wide-Area Frequency Stability Predictive Control, Fifth International Conference on Critical Infrastructure (CRIS), 20-22 September 2010, Beijing, China, pp. 1-7.

Fadul, J.E., Hopkinson, K.M., Andel, T.R., Kurkowski, S., Moore, J.T., Simple Trust Protocol for Wired and Wireless SCADA Networks, *International Conference on Information Warfare and Security (ICIW)*, 8-9 April 2010, Wright-Patterson AFB, OH, USA, pp. 89-97.

Tiwari, A., Ganguli, A., Shen, B., Krishnamurthi, N., Gerla, G., Compton, M., and Hopkinson, K., Feasibility of Communication Planning in Airborne Networks Using Mission Information, *2009 Military Communications Conference (MILCOM)*, 18 - 21 October 2009, Boston, MA, USA, pp. 1-7. [ANT]

Gocmen, M., Hopkinson, K.M., Compton, M., The Benefits of a Network Tasking Order in Combat Search and Rescue Missions, *2009 Military Communications Conference (MILCOM)*, 18 - 21 October 2009, Boston, MA, USA, pp. 1-7. [ANT]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

2009 Delegate, U.S. North American Synchrophasor Initiative (NASPI) Work Group Meeting in Chattanooga, Tennessee, October 7-8, 2009.

Program Committee Member: 2010 IEEE 6th World Congress on Services (SERVICES), Miami, Florida, July 5-10.

Program Committee Member: 2010 IEEE 3rd International Conference on Cloud Computing (CLOUD), Miami, Florida, July 5-10.

Program Committee Member: 2010 IEEE 1st International Workshop on Smart Grid Communications (SmartGridComm), Cape Town, South Africa, May 23-27.

Reviewer: IEEE Transactions on Power Delivery.

Reviewer: 2009 Palgrave MacMillan Journal of Simulation (JOS).

Representative for AFIT to IEEE Dayton (Local IEEE Chapter).

HUMPHRIES, JEFFREY W., Lt Col,

Assistant Professor of Computer Science, Department of Electrical and Computer Engineering, AFIT
Appointment Date: 2008 (AFIT/ENG), BS Computer Science, United States Air Force Academy, 1992; MS Computer Science, Georgia Institute of Technology, 1993; PhD, Texas A&M University, 2001. His research interests include cryptography, computer/network security, information assurance, cyber operations, and software protection. Tel. 937-255-3636 x7253 (DSN 785-3636 x7253), email: Jeffrey.Humphries@afit.edu

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Juan Lopez Jr., Eddie A. Mendezllovet, and J.W. Humphries, "Engineering Mission Assurance for the Cyber Security of Supervisory Control and Data Acquisition (SCADA) Systems," 2010 International Conference on Security and Management (SAM'10), July 12-15, 2010. [CCR]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Lead curriculum developer for PCE Cyber 300 course for new 17D career field. [CCR]

Humphries, J.W., "Dixon's Algorithm for Large Integer Factorization," Cedarville University, November 2009.

Committee Member, 5th *International Conference on Information Warfare and Security*, Air Force Institute of Technology, Ohio, 8-9 April 2010.

Journal reviewer, *Journal of Defense Modeling and Simulation*, 2010.

HYDE, MILO W., Capt,

Assistant Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT
Appointment Date: 2010 (AFIT/ENG); BS, Computer Engineering, Georgia Institute of Technology, 2001; MSEE, Air Force Institute of Technology, 2006; PhD, Electrical Engineering, Air Force Institute of Technology, 2010. His research interests include electromagnetic material characterization, optical material characterization, guided-wave theory, scattering, and optics. Tel. 937-255-3636 x4371 (DSN 785-3636 x4371), email: milo.hyde@afit.edu

JACKSON, JULIE A.,

Assistant Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT
Appointment Date: 2009 (AFIT/ENG), BS, Electrical Engineering, Wright State University, 2002; MS, Electrical Engineering, The Ohio State University, 2004; PhD, Electrical Engineering, The Ohio State University 2009. Her research interests include electromagnetics, statistical modeling, and imaging algorithms for radar. She is a member of Tau Beta Pi, IEEE, and ASEE. Tel. 937-255-3636 x4678 (DSN 785-3636 x4678), email: Julie.Jackson@afit.edu

SPONSOR FUNDED EDUCATIONAL PROJECTS

"Travel Support for a New, Female, Tenure-Track Assistant Professor in Electrical Engineering." Sponsor: NSF. Funding: \$3,472.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

- J. A. Jackson, "Automated Image Segmentation for Synthetic Aperture Radar Feature Extraction," National Aerospace and Electronics Conference, NAECON 2010 in Dayton, OH, July 14-16, 2010.
- J. R. Gutierrez and J. A. Jackson "Bistatic Ambiguity Function Evaluation of the WiMAX Waveform for PCL Systems," National Aerospace and Electronics Conference, NAECON 2010 in Dayton, OH, July 14-16, 2010.
- J. A. Jackson, "Closed-form, Bistatic, 3D Scattering Solution for a Dihedral Corner Reflector," Progress in Electromagnetics Research Symposium, PIERS 2010 in Cambridge, MA, July 5-8, 2010.
- J. A. Jackson, R. L. Moses, "3D Feature Estimation for Sparse, Nonlinear Bistatic SAR Apertures," IEEE Radar Conference, Washington DC, May 11-14, 2010.
- J. E. McGowan, S. C. Gustafson, J. A. Jackson, A. J. Terzuoli Jr., "The Effect of Synthetic Aperture Radar Image Resolution on Target Discrimination," Algorithms for Synthetic Aperture Radar Imagery XVII, E. G. Zelnio and F. D. Garber, eds., Proceedings of SPIE, vol. 7699, 76990X, Orlando, Florida, 5-9 April 2010.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Poster Presentation: J. A. Jackson, G. A. Akers, and M. A. Saville, "Radar Systems and Signals Research in the AFIT Radar Instrumentation Laboratory," Ohio Innovation Summit for Sensors at IDCAST, Dayton, OH, June 14-15, 2010.

Served as a peer reviewer for 3 journal papers and 7 conference papers.

Member of Technical Program Committee for IEEE Radar Conference held in Washington DC, May 11-14, 2010.

Co-chair for the "Radar Signal Processing & Image Processing" track at the National Aerospace and Electronics Conference (NAECON) held in Dayton, OH, July 14-16, 2010.

KIM, YONG C.,

Assistant Professor of Computer Engineering, Department of Electrical and Computer Engineering, AFIT
Appointment Date: 2003 (AFIT/ENG); BSCE, University of Washington, 1995; MSECE, University of Wisconsin, 1997; PhD, University of Wisconsin, 2002. His areas of interest are anti-tamper methodology for circuits, hardware assurance, advanced computer architecture, VLSI design, test, design for testability, synthesis, CAD tools, reconfigurable and fault-tolerant computing. Tel. 937-255-3636 x4620 (DSN 785-3636 x4620), email: Yong.Kim@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

"Anti-Temper Method for Field Programmable Gate Arrays." Sponsor: AFRL/RV. Funding: \$100,000.

"Architectural Framework for Evaluating General, Efficient and Measurable Program Protection." Sponsor: AFOSR. Funding: \$27,767. [CCR]

REFEREED JOURNAL PUBLICATIONS

- D. M. Arnold, J. McClory, J. C. Petrosky, E. Lam and Y.C. Kim, "Stability of Gamma Irradiated Synchronous_Dynamic Random Access Memory (SDRAM)," *Journal of Radiation Effects, Research Engineering*, vol. 28, no 1, July 2010.

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., Oct 2009.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Nathan Naber, Thomas Getz, Yong C Kim, and James Petrosky, "Real-Time Fault Detection and Diagnostics Using FPGA-Based Architectures," *IEEE International Conference on Field Programmable Logic and Applications (ICFPL 2010)*, 6 pages, Milan, Italy, Aug 31 – Sep 2, 2010.

James Parham, Yong Kim, J. Todd McDonald, and Michael Grimalia, "Hiding Circuit Components Using Boundary Blurring Techniques," *IEEE Annual Symposium on VLSI (ISVLSI10)*, 4 pages, Lixouri, Cephalonia, Greece, Jul 2010.

J. Todd McDonald, Yong C. Kim, Eric D. Trias, and Michael R. Grimalia. "Using Logic-Based Reduction For Adversarial Component Recovery," *25th Symposium on Applied Computing, (SIGAPP SAC10)*, vol 3., pp. 1993-2000, Sierre, Switzerland, March 22-26, 2010.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Academic Resource Committee ENG Representative 2009 – Present.

Academic Standard Committee ENG Alternate Representative for ENG Department.

ENG Curriculum Chair, Digital Systems and VLSI/VHSIC Sequences.

Member of Program Committee of IEEE International Conference on Field Programmable Logic and Apps 2010.

Reviewer for Journal of Electronic Testing.

Reviewer for IEEE Trans. on Computers, Computer-Aided Design, and VLSI Systems.

Reviewer for IEEE International Test Symposium.

Reviewer for Design Automation Conference 2009 and 2010.

KURKOWSKI, STUART H., Lt Col,

Assistant Professor of Computer Science, Department of Electrical and Computer engineering, AFIT
Appointment Date: 2006 (AFIT/ENG), BSCS, United States Air Force Academy, 1991; MSIM, Troy State University, 1995; MSCS, Air Force Institute of Technology, 2000; PhD, Colorado School Mines, 2006.
His research interest include software engineering, visualization and simulation. Tel. 937-255-3636 x7228; email: Stuart.Kurkowski@afit.edu

REFEREED JOURNAL PUBLICATIONS

Coates, G.M., Hopkinson, K.M., Graham, S.R., Kurkowski, S.H., A Trust System Architecture for SCADA Network Security, *IEEE Transactions on Power Delivery*, Volume 25, Issue 1, January 2010, pp. 158-169.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Fadul, J.E., Hopkinson, K.M., Andel, T.R., Kurkowski, S., Moore, J.T., Simple Trust Protocol for Wired and Wireless SCADA Networks, *International Conference on Information Warfare and Security (ICIW)*, 8-9 April 2010, Wright-Patterson AFB, OH, USA, pp. 89-97.

A. Honoré, R. Thomas, R. K. Martin, and S. Kurkowski, "Implementation of Collaborative RF Localization Using a Software-Defined Radio Network," in *Proc. Military Comm. Conf.*, Boston, MA, October 2009, 7 pages.

LAMONT, GARY B.,

Professor in the Department of Electrical and Computer Engineering, AFIT Appointment Date: 1970 (AFIT/ENG), B. of Physics, 1961; MSEE, 1967, PhD, 1970; University of Minnesota. He teaches courses in computer science and computer engineering. His research interests include: evolutionary computation, artificial immune systems, information security, parallel and distributed computation, combinatorial optimization problems (single objective and multi-objective), software engineering, digital signal processing, and intelligent and distributed control. He has advised many MS and PhD students in these disciplines. Dr. Lamont has authored several textbooks (Multi-Objective EAs, Computer Control), various book chapters as well as numerous papers. He is a member of IEEE (senior member) ACM, ASEE, SIAM, Tau Beta Pi (chapter advisor) and Eta Kappa Nu. Tel. 937-255-2626x4718; email: Gary.Lamont@afit.edu

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

IEEE NAECON 2010 Program Chair.

ACM GECCO 2010 Program Committee and paper reviewer.

IEEE CEC 2010 Program Committee and paper reviewer.

SEAL 2010 Program Committee.

IEEE Transactions on Evolutionary Computation paper reviewer.

Optimization of multi-sensor radar systems: AFRL/RYDR.

MARTIN, RICHARD K.,

Associate Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT 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

SPONSOR FUNDED RESEARCH PROJECTS

"Laser Radar Range Resolution Enhancement Through 3D Registration and Deconvolution." Sponsor: AFOSR. Funding: \$42,384.

"RF Anomaly Detection for Intent Assessment." Sponsor: ONR. Funding: \$91,281.

"Technical Support: Cognitive Communications Research." Sponsor: AFRL/RY. Funding: \$17,000.

"Technical Support: Cognitive Networks Research." Sponsor: AFRL/RY. Funding: \$39,698.

REFEREED JOURNAL PUBLICATIONS

Syed Imtiaz Husain, Jinhong Yuan, Jian Zhang, and Richard 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.

Richard K. Martin and Ryan W. Thomas, "Algorithms and Bounds for Estimating Location, Directionality, and Environmental Parameters of Primary Spectrum Users," *IEEE Transactions on Wireless Communications*, vol. 8, no. 11, November 2009, pp. 5692-5701.

Jason R. McMahon, Richard K. Martin, and Stephen C. Cain, "3D FLASH LADAR Range Estimation via Blind Deconvolution," *The Journal of Applied Remote Sensing*, Vol. 4, 043517, Mar 2010, pp. 1-28.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

A. Honoré, R. Thomas, R. K. Martin, and S. Kurkowski, "Implementation of Collaborative RF Localization Using a Software-Defined Radio Network," in *Proc. Military Comm. Conf.*, Boston, MA, October 2009, 7 pages.

R. K. Martin, "Wireless Network Discovery Via RSS-based Estimation of Multi-transmitter RF Footprint," in *Proc. The Third International Workshop on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP)*, Aruba, Dutch Antilles, December 2009, 4 pages.

M. A. Saville, K. Monroe, C. Allen, and R. K. Martin, "Processing-based Tuner Gain Correction in a Wideband Multi-channel Receiver," in *Proc. IEEE RADAR Conf.*, Washington, D.C., May 2010, 4 pages.

A. W. Yarbrough, M. J. Mendenhall, and R. K. Martin, "The Effect of Atmospheric Mis-Estimation on Hyperspectral-Based Adaptive Matched Filter Target Detection as Measured by the Bhattacharya Coefficient," in *Proc. IEEE Workshop on Hyperspectral Image and Signal Processing (WHISPERS)*, Reykjavik, Iceland, June 2010, 4 pages.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

A. Gross, R. Thomas, R. Martin, and M. Silvius, Handshaking Protocols and Jamming Mechanisms for Blind Rendezvous in a DSA Environment, in *Proc. of Wireless@VT Symposium 2010*, June 2010, 11 pages.

Richard K. Martin, Ryan W. Thomas, and Mark D. Silvius, "Summary of Cognitive and Software-Defined RF Technology Development," AFRL workshop, Cognitive & Software-Defined RF Technology: Achieving Spectral Dominance for the Air Force of the Future, September 2010, Rome, NY.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Gave invited talk at Wright State: R. K. Martin, "Navigation and Positioning via Radio Signals," *Spring Lecture Series for Undergraduates*, Wright State University, Department of Mathematics and Statistics, 7 April 2010.

Provided instruction to AFRL/Ryre staff regarding angle of arrival estimation algorithms, to aid in evaluation of a SBIR final report; May 2010.

Hosted Dr. Chris Anderson, Assistant Professor, from the US Naval Academy (Annapolis, MD), for a colloquium and technical interchange on 14 June 2010. (Joint activity with Maj Thomas and Maj Silvius.)

Served as a peer reviewer for 13 journal papers and 10 conference papers.

Conference session chair for session on Wireless Networks, at *The Third International Workshop on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP)*, Aruba, Dutch Antilles, December 2009.

Technical Program Committee Member, *The 25th Biennial Symposium on Communications*, Queen's University, Kingston, Ontario, May 2010.

McDONALD, J. TODD, Lt Col,

Assistant Professor of Computer Science, Department of Electrical and Computer Engineering, AFIT
Appointment Date: 2006 (AFIT/ENG), BSCS, United States Air Force Academy, 1986; MBA, University of Phoenix, 1996; MSCE, Air Force Institute of Technology, 2000; PhD, Computer Science, Florida State University, 2006. His research interests include software protection, reverse engineering cyber situational awareness, mobile agents, and software engineering. Tel. 937-255-3636 x4639 (DSN 785-3636 x4639), email: Jeffrey.McDonald@afit.edu

REFEREED JOURNAL PUBLICATIONS

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, Sept/Oct., 2009. [CCR]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

James Parham, Yong Kim, J. Todd McDonald, and Michael Grimalia, "Hiding Circuit Components Using Boundary Blurring Techniques," *IEEE Annual Symposium on VLSI (ISVLSI10)*, 4 pages, Lixouri, Cephalonia, Greece, Jul 2010. [CCR]

J. Todd McDonald, Yong C. Kim, Eric D. Trias, and Michael R. Grimalia. "Using Logic-Based Reduction For Adversarial Component Recovery," *25th Symposium on Applied Computing, (SIGAPP SAC10)*, vol 3., pp. 1993-2000, Sierre, Switzerland, March 22-26, 2010. [CCR]

Murphy, S, McDonald, J., and Mills, R.F., "An Application of Deception in Cyberspace: Operating System Obfuscation," 5th International Conference on Information Warfare and Security (ICIW 2010), Dayton OH 8-9 Apr 2010. [CCR]

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

SPONSOR FUNDED RESEARCH PROJECTS

"Dismount and Change Detection." Sponsor: AFRL/RY. Funding: \$30,000. [ANT]

"Sensor Exploitation for Human MASINT." Sponsor: 711 HPW/RH. Funding: \$50,000. [ANT]

REFEREED JOURNAL PUBLICATIONS

D. Reising, M.A. Temple and M.J. Mendenhall, "Improved Wireless Security for GMSK-Based Devices Using RF Fingerprints," *Int'l Jour. of Electronic Security and Digital Forensics (IJESDF)*, Vol 3, No 1, 2010.

R.A. Klein, M.A. Temple, and M.J. Mendenhall, "Application of Wavelet-Based RF Fingerprinting to Enhance Network Security, *Jour. of Communications and Networks-Special Issue: Secure Wireless Networking*, 11:6:544-555, Jan 2010.

R.A. Klein, M.A. Temple, and M.J. Mendenhall, "Application of Wavelet Denoising to Improve OFDM Based Signal Detection and Classification," *Jour. of Security and Communications Networks*, Vol 2, Issue 6, Nov/Dec 2009.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

- K. Vongsy and M.J. Mendenhall, "Improved Change Detection Through Post Change Classification: A Case Study Using Synthetic Hyperspectral Imagery," Second Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing, IEEE WHISPERS, Reykjavik Iceland, 14-16 June 2010, pp. 1-4. [ANT]
- A. Yarbrough, M.J. Mendenhall, and R.K. Martin, "The Effects of Atmospheric Mis-Estimation on Hyperspectral-Based Adaptive Matched Filter Target Detection as Measured by the Bhattacharyya Coefficient," Second Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing, IEEE WHISPERS, Reykjavik Iceland, 14-16 June 2010, pp. 1-4. [ANT]
- J.D. Clark, M.J. Mendenhall, and G.L. Peterson, "Stochastic Feature Selection With Distributed Feature Spacing for Hyperspectral Data," Second Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing, IEEE WHISPERS, Reykjavik Iceland, 14-16 June 2010, pp. 1-4. [ANT]
- S. Bischoff, M.J. Mendenhall, A.C. Rice, and J.R. Vaquez, "Adapting Learning Parameter Transition in the Generalized Learning Vector Quantization Family of Classifiers," Second Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing, IEEE WHISPERS, Reykjavik Iceland, 14-16 June 2010, pp. 1-4.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

- A.W. Yarbrough, M.J. Mendenhall, and S. Fiorino, "Measuring the Error Between Actual and Estimated Atmospheric and The Effect on Estimating Reflectance Profiles," IEEE International Geoscience and Remote Sensing Symposia, Honolulu Hawaii, 25-30 July 2010.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

- M.J. Mendenhall and J. Kerekes, "Special Session on: Exploitation Algorithms Using Synthetic Hyperspectral Data," Second Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing, IEEE WHISPERS, Reykjavik Iceland, 14-16 June 2010.

Transitioned human skin detection technology to the Air Force Special Operations Command. [ANT]

Technical Reviewer, Journal of Defense Modeling and Simulation.

Technical Reviewer, IEEE Transaction on Neural Networks.

Technical Reviewer, Elsevier Knowledge-Based Systems. [ANT]

Technical Reviewer, IEEE Transactions on Geoscience and Remote Sensing. [ANT]

Technical Reviewer, IEEE 2nd Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing. [ANT]

Program Committee, IEEE 2nd Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing. [ANT]

MILLS, ROBERT F.,

Assistant Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT
Appointment Date: 2003 (AFIT/ENG), BS, Electrical Engineering, Montana State University, 1983; MS, Electrical Engineering, AFIT, 1987; PhD, Electrical Engineering, University of Kansas, 1994. His research interests include network management and security, cyber operations and warfare, systems engineering, communications systems. Tel. 937-255-3636 x4527 (DSN 785-3636 x4527), email: Robert.Mills@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

“Efficient Auditing to Mitigate the Insider Threat.” Sponsor: NSA. Funding: \$27,450. [CCR]

REFEREED JOURNAL PUBLICATIONS

Beeker, K., Mills, R.F., and Grimaila, M.R., “Applying Deterrence in Cyberspace,” *Information Operations Journal*, Vol. 1, Issue 4, February 2010, pp. 21-27. [CCR]

Dalton, G.C., Edge, K.S., Mills, R.F., and Raines, R.A., “Analyzing Security Risks in Computer and Radio Frequency Identification (RFID) Networks Using Attack and Protection Trees,” *International Journal of Security and Networks*, Vol. 5, Nos. 2/3, 2010, pp. 87-95. [CCR]

Larkowski, M.P., Mills, R.F., and Colombi, J.M., “The Cyberspace Development Dogfight: Tightening the Acquisitions Turn Circle,” *High Frontier*, November 2009, Vol. 6 No. 1, pp. 44-49. [CCR]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Bares, D.C., Trias, E.D., and Mills, R.F., “A Tactical Framework for Cyberspace Situational Awareness,” submitted to 15th International Command and Control Research and Technology Symposium (ICCRTS), Santa Monica CA, 22-24 June 2010. [CCR]

Murphy, S, McDonald, J., and Mills, R.F., “An Application of Deception in Cyberspace: Operating System Obfuscation,” 5th International Conference on Information Warfare and Security (ICIW 2010), Dayton OH 8-9 Apr 2010. [CCR]

Arwood, S., Mills, R.F., and Raines, R.A., “Operational Art and Strategy in Cyberspace,” 5th International Conference on Information Warfare and Security (ICIW 2010), Dayton OH 8-9 Apr 2010. [CCR]

Hale, B., Grimaila, M.R., Mills, R.F., and Haas, M. “Communicating Potential Mission Impact Using Shared Mission Representations,” 5th International Conference on Information Warfare and Security (ICIW 2010), Dayton OH 8-9 Apr 2010. [CCR]

Myers, J., Grimaila, M.R., and Mills, R.F. “Insider Threat Detection Using Distributed Event Correlation of Web Server Logs,” 5th International Conference on Information Warfare and Security (ICIW 2010), Dayton OH 8-9 Apr 2010. [CCR]

Myers, J., Grimaila, M., and Mills, R., “Adding Value to Log Event Correlation Using Distributed Techniques,” Proceedings of the Cyber Security and Information Intelligence Research Workshop (CSIIRW 2010), Oak Ridge National Laboratory, Oak Ridge, TN, April 21-23, 2010. [CCR]

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]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Technical reviewer, International Workshop on Mission Assurance: Tools, Techniques, and Methodologies.

Chaired sessions on Botnets and Intrusion Detection, *International Conference on Information Warfare and Security* (ICIW), Dayton OH, Apr 2010.

Program Committee Member, *International Conference on Information Warfare and Security* (ICIW).

Technical Paper Referee, Institution of Engineering and Technology Communications Journal.

Technical Paper Referee, International Conference on Information Warfare and Security (ICIW).

Cyber Warfare Short Course, Sandia National Laboratory, Kirtland AFB NM, 14-16 Sep 2010 (20 hrs, 20 students).

MULLINS, BARRY E.,

Assistant Professor of Computer Engineering, Department of Electrical and Computer Engineering, AFIT
Appointment Date: 2004 (AFIT/ENG), BS Computer Engineering (cum laude), University of Evansville, 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, computer/network security, computer communication networks, embedded (sensor) and wireless networking, and reconfigurable computing. Tel. 937-255-3636 x7979 (DSN 785-3636 x7979), email: Barry.Mullins@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

“Cyber Operations Support.” Sponsor: 318 Info Op Group. Funding: \$24,000. [CCR]

REFEREED JOURNAL PUBLICATIONS

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 (IJAACS), Vol. 3, No. 3, April 2010, pp. 350-368. [CCR]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

D. A. Dodge, B. E. Mullins, G. L. Peterson and J. S. Okolica, “Simulating Windows-Based Cyber Attacks Using Live Virtual Machine Introspection,” Summer Computer Simulation Conference (SCSC10), Ottawa, Canada, July 2010, pp. 550-555. [CCR]

C.P. Barnard and B. E. Mullins, “BotNet Communication in an Asymmetric Information Warfare Campaign,” 5th International Conference on Information Warfare and Security (ICIW 2010), Air Force Institute of Technology, Wright-Patterson AFB OH, 8-9 April 2010, pp. 23-27. [CCR]

N. S. Kovach and B. E. Mullins, “Malware Detection via a Graphics Processing Unit,” 5th International Conference on Information Warfare and Security (ICIW 2010), Air Force Institute of Technology, Wright-Patterson AFB OH, 8-9 April 2010, pp. 212-215. [CCR]

B. D. Thomas and B. E. Mullins, “An FPGA-based Malicious DNS Packet Detection Tool,” 5th International Conference on Information Warfare and Security (ICIW 2010), Air Force Institute of Technology, Wright-Patterson AFB OH, 8-9 April 2010, pp. 337-342. [CCR]

D. R. Karrels, G. L. Peterson and B. E. Mullins, “RC-Chord: Resource Clustering in a Large-Scale Hierarchical Peer-to-Peer System,” IEEE Military Communications Conference (MILCOM 2009), October 2009, pp. 1-7. [CCR]

M. T. Woelfle, M. A. Temple, B. E. Mullins and M. J. Mendenhall, “Detecting, Identifying and Locating Bluetooth Devices Using RF Fingerprints,” IEEE Military Communications Conference (MILCOM 2009), October 2009, classified session. [CCR]

BOOKS AND CHAPTERS IN BOOKS

K. R. Schrader, B. E. Mullins, G. L. Peterson and R. F. Mills, “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]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Member, Technical Program Committee for the 6th International Conference on Information Warfare and Security (ICIW 2011). [CCR]

Reviewer, IEEE Military Communications Conference (MILCOM 2010). [CCR]

Member, Technical Program Committee for the Wireless Networking Symposium (WNS) at 2010 IEEE Global Communications Conference (GLOBECOM 2010). [CCR]

Member, Executive Committee for the 5th International Conference on Information Warfare and Security (ICIW 2010). [CCR]

Member, Technical Program Committee for the 5th International Conference on Information Warfare and Security (ICIW 2010). [CCR]

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, Advisory Board for the Global Information Assurance Certification for the SANS Institute.

Member, Advisory Board for the Department of Electrical Engineering and Computer Science, University of Evansville.

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

SPONSOR FUNDED RESEARCH PROJECTS

"Blended Covert Navigation." Sponsor: AFRL/RV. Funding: \$15,000. [ANT]

"Cooperative Control." Sponsor: AFRL/RB. Funding: \$10,000.

"Cooperative Intelligent Control and Estimation." Sponsor: AFOSR. Funding: \$47,793.

"Decision Support Techniques." Sponsor: AFRL/RV. Funding: \$15,000. [ANT]

"Preempting the Adversary: Anticipatory Planning." Sponsor: NSA. Funding: \$67,736.

REFEREED JOURNAL PUBLICATIONS

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. [ANT]

D. Jacques, J. Bode and M. Pachter: "Optimization of an Autonomous Weapon's Operating Characteristic," *IEEE Systems Journal*, Vol. 3, No 4, pp. 489-498, December 2009. [ANT]

M. Pachter and K. Pham: "Discrete-Time Linear-Quadratic Dynamic Games," *Journal of Optimization Theory and Applications*, Vol.146/2, August 2010. [ANT]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

M. Pachter and K. Pham: "The Role of Information in Linear-Quadratic Games," 2nd International Conference on the Dynamics of Information Systems, Destin, FL, February 3-5, 2010. [ANT]

M. Pachter and G. Mutlu: "The Navigation Potential of Ground Feature Tracking - the 3-D Case," 50th Israel Annual Conference on Aerospace Sciences, February 17-18, 2010, Tel Aviv, Israel. [ANT]

M. Pachter: "Static Linear-Quadratic Gaussian Games," 14th International Symposium on Dynamic Games and Applications, Banff, Canada, June 20-22, 2010. [ANT]

M. Pachter and G. Mutlu: "The Navigation Potential of Ground Feature Tracking for Aircraft Navigation," American Control Conference, Baltimore, MD, June 30 - July 2, 2010. [ANT]

"Approximate Dynamic Programming with State Aggregation applied to Perimeter Patrol," AIAA Guidance, Navigation and Control Conference, Toronto, Canada, 2-5 August 2010. AIAA paper 2010-8436. [ANT]

"The Navigation Potential of Ground Feature Tracking for Aircraft Navigation," American Control Conference, Baltimore, MD, June 30 - July 2, 2010. [ANT]

BOOKS AND CHAPTERS IN BOOKS

P. Chandler and M. Pachter: "Challenges," in "Unmanned Aerial Vehicles Cooperative Decision and Control: Challenges and Practical Approaches," T. Shima and S. Rasmussen, Editors. Book published by SIAM, 2009, pp. 15-35. [ANT]

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. Book published by SIAM, 2009, pp. 104-124. [ANT]

M. Pachter: "The LQG Game Against Nature," in *Advances in Dynamic Games and Their Applications*, P. Bernhard, V. Gaitsgory and O. Pourtallier editors, Birkhauser 2009, pp. 339-353. [ANT]

J. Bode, D. Jacques and M. Pachter: "Optimal Control of the Weapon Operating Characteristic with Control Inequality Constraints," *Optimization and Cooperative Control Strategies*, LNCS, Springer, 2009. [ANT]

J. Baker, R. Holsapple, A. Girard, M. Pachter and P. Chandler: "Operator - Aided Decision Processes for Unmanned Aerial Vehicles in a Stochastic Environment," *Optimization and Cooperative Control Strategies*, LNCS, Springer, 2009. [ANT]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

DAGSI Coordinating Committee (Control and Signal Processing).

Associate Editor of the Journal of Optimization Theory and Applications.

International Program Committee for the IFAC Symposium on Robust Control Design, Haifa, Israel, June 2010.

Reviewer for IEEE Trans. on Automatic Control.

Reviewer for IEEE Trans. on Aerospace and Electronic Systems.

Reviewer for AIAA J. of Guidance, Control and Dynamics.

Reviewer for International Journal of Control.

Member of AFOSR Review Panel.

AFIT NRC Postdoctoral Advisor.

Associate Fellow of the AIAA.

“Preempting the Adversary: Anticipatory Planning,” NSA, Baltimore, MD, March 12, 2010.

“The Role of Information in Linear-Quadratic Dynamic Games,” Tel Aviv University, Tel Aviv, June 9 2010, and Israel Institute of Technology, Haifa, June 14, 2010.

PETERSON, GILBERT L.,

Associate Professor of Computer Engineering, Department of Electrical and Computer Engineering, AFIT
Appointment Date: 2002 (AFIT/ENG); BS Architecture University of Texas at Arlington, 1995; MS,
Computer Science, University of Texas at Arlington, 1998; PhD, University of Texas at Arlington, 2001. His
research interests include uncertainty in artificial intelligence, robotics, machine learning, and digital
forensics. Tel. 937-255-6565 x4281 (DSN 785-6565 x4281), email: Gilbert.Peterson@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

“AFIT Support for AFRL Cybercraft Project.” Sponsor: AFOSR. Funding: \$50,000. [CCR]

“INSeCT: Intelligent Navigation and Sensing Cooperative Tasks.” Sponsor: AFRL/RV. Funding: \$120,000.
[ANT]

“MEMSENSE: Hypervisor-Based Memory Sensing for Network Defense Applications.” Sponsor: AFRL/RI.
Funding: \$100,000. [CCR]

“UBR-Brawler.” Sponsor: AFMC. Funding: \$100,000. [ANT]

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.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Erskine, J.R., Peterson, G.L., Mullins, B.E., and Grimaila, M.R., “Developing Cyberspace Data Understanding Using CRISP-DM for Host-based IDS Feature Mining,” *Cyber Security and Information Intelligence Research Workshop*, Knoxville, TN, April 2010, pp. 1-4.

Hooper, D.J., Peterson, G.L., and Borghetti, B.J., "Dynamic Coalition Formation under Uncertainty," *Proceedings of the 2009 IEEE/RSJ International Conference on Intelligent Robots and Systems*, St Louis, MO, October 2009, pp. 4799-4804. [ANT]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Compiled Memory Analysis Tool. Released to FBI Miami Valley Regional Computer Forensics Laboratory (FBI/MVRCFL). Technology being integrated into popular Volatility Memory Analysis Tool by Schatz Forensics Ltd. LDA-SOM Text Mining. Transitioned to Joint Improvised Explosive Device Defense Organization (JIEDDO) ORSA Branch. [CCR]

Vice-Chair, International Federation for Information Processing, Working Group 11.9 – Digital Forensics.

Co-Chair, Seventh Annual IFIP WG 11.9 International Conference on Digital Forensics.

Special Issue Guest Editor, Journal of Defense Modeling and Simulation, Special Issue on Cyber Defense – Methodologies and Techniques for Evaluation.

Program Committee Member, International Information Security Conference (SEC 2010): Security & Privacy – Silver Linings in the Cloud.

Technical Program Committee Member, 10th Annual Digital Forensics Research Workshop.

Program Committee Member, ANTS 2010.

Technical Program Committee Member, Computer Forensics Track of the 24th Annual ACM Symposium on Applied Computing.

Technical Paper Reviewer, International Journal of Critical Infrastructure Protection.

Technical Paper Reviewer, Digital Forensics Practice.

Technical Paper Reviewer, Research Letters in Signal Processing.

Technical Paper Reviewer, IEEE Transactions on Evolutionary Computation.

Technical Paper Reviewer, Information Science.

Technical Paper Reviewer, IROS 2010.

POTOCZNY, HENRY B.,

Professor Emeritus 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

POCHET, MICHAEL C., Capt,

Assistant Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2010 (AFIT/ENG); BS, Electrical Engineering, Virginia Tech, 2001; MS Electrical Engineering, Air Force Institute of Technology, 2006; PhD, Electrical Engineering, University of New Mexico, 2010. His research interests include techniques for high-speed direct modulation of novel semiconductor laser structures and development of cathode materials for high power microwave sources. Tel. 937-255-3636 x4393 (DSN 785-3636 x4396), email: michael.pochet@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

SPONSOR FUNDED EDUCATIONAL PROJECTS

“IASP Tuition and Resource Support for the AFIT Center for Cyberspace Research.” Sponsor: NSA.
Funding: \$248,829. [CCR]

REFEREED JOURNAL PUBLICATIONS

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 on Autonomous and Adaptive Communications Systems (IJAACS)*, Vol. 3, No. 3, April 2010, pp. 350-368. [CCR]

G. C. Dalton II, K. S. Edge, R. F. Mills, and R. A. Raines, “Analysing Security Risks in Computer and Radio Frequency Identification (RFID) Networks Using Attack and Protection Trees,” *International Journal of Security and Networks (IJSN)*, Special Issue on Security and Privacy in RFID Systems. Vol. 5, Nos. 2/3, 2010, pp. 87-95. [CCR]

S. Cooper, C. Nickell, V. Piotrowski, B. Oldfield, A. Abdallah, M. Bishop, B. Caelli, M. Dark, E. K. Hawthorne, L. Hoffman, L. Pérez, C. Pfleeger, R. Raines, C. Schou, and J. Brynielsson, “An Exploration of the Current State of Information Assurance Education.” *SIGCSE Bulletin* Vol. 41, No. 4, December 2009, pp. 109-125. [CCR]

J. Schavland, Y. Chan, and R. A. Raines, “Information Security: Designing a Stochastic-Network for Reliability and Throughput,” *Naval Research Logistics*, Vol. 56, No. 7, October 2009, pp. 625-641. [CCR]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

T. E. Dube, R. A. Raines, S. K. Rogers, G. L. Peterson, and K. W. Bauer, “An Investigation of Malware Type Classification,” 5th International Conference on Information Warfare and Security, Dayton Ohio, April 2010, pp. 398-406. [CCR]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Director, Center for Cyberspace Research and AF Cyberspace Technical Center of Excellence. [CCR]

OSD/OFT Transformation Chair Member, Information Assurance Scholarship Program (IASP) selection board, Air Force Personnel Center, Randolph AFB, TX.

Point of Contact, AFIT Information Assurance and Security Center of Academic Excellence accreditation with the National Security Agency.

Session Chair, 14th Colloquium for Information Systems Security Education (CISSE).

Technical Paper Referee, 2010 IEEE Military Communications Conference (MILCOM) (2 papers).

Steering Group Member, National Science Foundation, Information Assurance Education and Workforce Development, April 2010.

Member, Federal Cybersecurity Workforce Transformation Working Group, Department of Homeland Security, Department of Defense, Office of Director of National Intelligence and Office of Personnel Management.

Technical Paper Referee, 14th Colloquium for Information Systems Security Education (CISSE) (3 papers).

Technical Paper Referee, International Journal of Critical Infrastructure Protection (2 papers).

Technical Paper Referee, 5th International Conference on Information Warfare and Security (2 papers).

Member, CNSS Education, Training, and Awareness Working Group.

Member, Information Assurance Education Working Group.

Technical Paper Referee, EURASIP Journal on Wireless Communications and Networking.

External Promotion and Tenure Reviewer, U.S. Military Academy.

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

SPONSOR FUNDED RESEARCH PROJECTS

“ANT Center Laboratory Support per Attachment 6 of the MOA between AFIT and AFRL.” Sponsor: AFRL/RV. Funding: \$429,035. [ANT]

“Non-GPS Navigation Using Radio-Based Ranging Combined with Additional Sensors.” Sponsor: Raytheon. Funding: \$100,000. [ANT]

“Low-Cost GPS Receiver Algorithm Development.” Sponsor: OSURF. Funding: \$50,000. [ANT]

“Precision Indoor and Outdoor Navigation Using Existing Signals of Opportunity and Inertial Navigation Sensors.” Sponsor: DAGSI. Funding: \$81,650. [ANT]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

McGinthy, J. and J. Raquet, “GNSS Software Receiver Development,” presented at 2010 Joint Navigation Conference, Orlando, FL, Jun 2010. [ANT]

Larson, C. and J. Raquet, “The Impact of Attitude on Image-Based Integrity,” Proceedings of ION International Technical Meeting, San Deigo, CA, Jan 2010. [ANT]

Kauffman, K., J. Morton, J. Raquet, and D. Garmatyuk, "Simulation Study of UWB-OFDM SAR for Dead Reckoning Navigation," Proceedings of ION International Technical Meeting, San Deigo, CA, Jan 2010. [ANT]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Raquet, J. "GNSS Navigation Solution and Differential GNSS," presented to 50 professors and students at Satellite Navigation Science and Technology Workshop for Africa, April 2010. [ANT]

Raquet, J. "A Framework for Image-Based Navigation," presented to 25 engineers at Nokia Research, Tampere, Finland, April 2010. [ANT]

AFIT PI for the Consortium of Ohio Universities on Navigation and Timekeeping (COUNT). [ANT]

Office of the Secretary of Defense (OSD) PNT S&T Roadmap, Jan 07 – present. Helping to update the OSD PNT S&T Roadmap, which is a document describing the S&T activities for PNT technology over the next 20 years. [ANT]

Executive Vice President, Institute of Navigation (ION) Satellite Division. [ANT]

Scientific (organizing) committee, International Conference on Ubiquitous Positioning, Indoor Navigation and Location-Based Service, Helsinki, Finland, Oct 2009. [ANT]

Awards Committee Member, Institute of Navigation. [ANT]

AFRL/RV, Consulting support for LEGAND program, Mar 2008 – present. [ANT]

DARPA, consulting support for S-BUG navigation program, Jan 2009 – present. [ANT]

SPAWAR Systems Center (Navy), Consulting support for INS/GPS integration, Apr 2009 – present. [ANT]

ROBINSON, DAVID J., Maj,

Assistant Professor of Computer Engineering, Department of Electrical and Computer Engineering, AFIT
Appointment Date: 2010 (AFIT/ENG); BS, Computer Science and Engineering, University of Connecticut, 1996; MSCE, Air Force Institute of Technology, 2000; PhD, Computer Engineering, Dartmouth College, 2010. His research interests include cyber-based behavioral modeling, quantitative analysis of cyber (science of cyber), and pro-active cyber defense. Tel. 937-255-3636 x4598 (DSN 785-3636 x4598), email: David.Robinson@afit.edu

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

SPONSOR FUNDED RESEARCH PROJECTS

"Bistatic Radar Technology Development and Signal Exploitation." Sponsor: AFRL/RV. Funding: \$21,500.

"Polarization-Based Feature Extraction." Sponsor: AS&T. Funding: \$70,940.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

S. H. R. Brady and M. A. Saville, "Scaling Radar Measurements for Advanced Algorithms," *Proc. 2010 IEEE International Radar Conference*, Arlington, VA, 10-14 May 2010 (6 pages).

M. A. Saville, K. Monroe, C. Allen, and R. Martin, "Processing-based Gain Calibration in a Wideband Multichannel Array," *Proc. 2010 IEEE International Radar Conference*, Arlington, VA, 10-14 May 2010 (6 pages).

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

D. F. Fuller and M. A. Saville, "Classification of canonical scattering through sub-band analysis," *Proc. of the SPIE Defense, Security and Sensing Symposium*, vol. 7699 Algorithms for Synthetic Aperture Radar Imagery XVII (12 pages), Orlando, FL, 5-9 Apr 2010.

D. E. Hack and M. A. Saville, "Verification of target motion effects on SAR imagery using the Gotcha GMTI challenge dataset," *Proc. of the SPIE Defense, Security and Sensing Symposium*, vol. 7699 Algorithms for Synthetic Aperture Radar Imagery XVII (12 pages), Orlando, FL, 5-9 Apr 2010.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Technical Committee Member, 2010 IEEE International Radar Conference, Washington D.C., USA.

Convener, Special Session, 2010 IEEE Electromagnetic Theory Symposium, Berlin, Germany.

Technical Planning Committee Member, 2010 MSS Tri-Service Radar Symposium, Orlando, FL, USA.

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

SPONSOR FUNDED RESEARCH PROJECTS

"Advanced Wavefront Estimation in Strong Turbulence." Sponsor: AFOSR. Funding: \$96,456. [CDE]

"Advanced Wavefront Sensing and Control." Sponsor: AFRL/RD. Funding: \$30,000. [CDE]

"Integrated Approach to Free-Space Optical Communications." Sponsor: AFOSR. Funding: \$7,080. [CDE]

"Material Characterization of an Unknown Object Using Passive Remote Sensing." Sponsor: AFOSR. Funding: \$16,120. [CDE]

REFEREED JOURNAL PUBLICATIONS

Milo W. Hyde, Jason D. Schmidt, and Michael J. Havrilla. *A geometrical optics polarimetric bidirectional reflectance distribution function for dielectric and metallic surfaces*. Opt. Express Vol. 17 Issue 24, pp. 22138-22153 (2009).

James A. Louthain and Jason D. Schmidt. *Synergy of adaptive thresholds and multiple transmitters in free-space optical communication*. Opt. Express. Vol. 18 Issue 9, pp. 8948-8962 (2010).

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Casey J. Pellizzari and Jason D. Schmidt. *Phase unwrapping in the presence of strong turbulence*. IEEE Aerospace Conference #1198. Big Sky, MT, March 2010.

Troy R. Ellis and Jason D. Schmidt. *Wavefront sensor performance in strong turbulence with an extended beacon*. IEEE Aerospace Conference #1289. Big Sky, MT, March 2010.

Daniel J. Wheeler and Jason D. Schmidt. *Correlation-based Shack-Hartmann wavefront slope sensing in strong turbulence*. IEEE Aerospace Conference #1296. Big Sky, MT, March 2010.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Jason A. Tellez and Jason D. Schmidt. *Multi-beam transmitter geometries for free-space optical communications*. Atmospheric Propagation of Electromagnetic Waves IV. SPIE #758803. San Francisco, CA, Jan 2010.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Session chair for 2010 IEEE Aerospace Conference, session 5.03: Adaptive Optics (new session).

Session organizer for 2011 IEEE Aerospace Conference, session 5.03: Adaptive Optics.

Session chair and program committee for 2010 SPIE Optics & Photonics Conference, session on Advanced Wavefront Control: Methods, Devices, and Applications VIII.

Reviewed article submissions for Optics Express.

Reviewed submitted book manuscript 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

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

M. Song, M. D. Silvius, R. W. Thomas, C. W. Bostian, "Firmware Defined Radio: Available Technologies and their Performance Tradeoffs," Software Defined Radio Forum Technical Conference, Washington, D.C., November 30 - December 3, 2010.

Young, M. D. Silvius, T. Brisebois, F. Ge, R. Rangnekar, and C. W. Bostian, "Virginia Tech CWT's Smart Radios: Challenges, Solutions and Lessons from the 2007 and 2008 Competitions," in Software Defined Radio Forum Technical Conference, Washington, D.C., December 1-4, 2009.

M. D. Silvius, A. B. MacKenzie, and C. W. Bostian, "Rendezvous MAC Protocols for use in Cognitive Radio Networks," in IEEE Military Communications Conference (MILCOM), Boston, MA, October 18-21, 2009.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Assisted Maj Mike Saville in providing consultation to AFRL/RIS for a FPGA signal processing back-end for a phased array radar.

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.

REFEREED JOURNAL PUBLICATIONS

Crossley, B.L., Kossler, M., Coutu, Jr., R.A., Starman, L.A. and Collins, P.J., "Effects of Hydrogen Pretreatment on Physical-Vapor-Deposited Nickel Catalyst for Multi-Walled Carbon Nanotube Growth," Journal of Nanophotonics Letters, Vol. 4, 049502:1-6, 2010.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Lundell, C.A., Collins, P.J, Coutu, Jr., R.A. and Starman, L.A., "RF Characterization and Testing of Adaptive RF Metamaterial Structure Using MEMS," The 11th International Symposium on MEMS and Nanotechnology, SEM Annual Conference, IN, 7-9 June 2010.

D. Langley, R.A. Coutu, Jr., L.A. Starman, P.J. Collins,"MEMS Integrated Metamaterial Structure Having Variable Resonance for RF Applications," The 11th International Symposium on MEMS and Nanotechnology, SEM Annual Conference, IN, 7-9 June 2010.

Crossley B.L., Coutu, Jr., R.A., Starman, L.A. and Collins, P.J., "Characterization of an Optimized Carbon Nanotube Field Emission Array," The 11th International Symposium on MEMS and Nanotechnology, SEM Annual Conference, IN, 7-9 June 2010.

Crossley B.L., Kossler, M., Coutu, Jr., R.A., Starman, L.A. and Collins, P.J., "Optimization of Carbon Nanotube Field Emission Arrays," Proceedings of the COMSOL conference, MA, 8-10 October 2009.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Crossley B.L., Kossler, M., Coutu, Jr., R.A., Starman, L.A. and Collins, P.J., "Optimization of Carbon Nanotube Field Emission Arrays," Proceedings of the COMSOL conference, MA, 8-10 October 2009.

Coutu, Jr., R.A., Edelman, T.A. and Starman, L.A., "Novel test fixture for collecting microswitch reliability data," SPIE Photonics West Symposium, Reliability, Packaging, Testing, and Characterization of MEMS/MOEMS and Nanodevices IX conference, CA, 23-28 January 2010.

Langley, D., Coutu, Jr., R.A., and Starman, L.A., "Experimental investigation into metamaterial structures operating at infrared wavelength," SPIE Photonics West Symposium, Reliability, Packaging, Testing, and Characterization of MEMS/MOEMS and Nanodevices IX conference, CA, 23-28 January 2010.

Crossley, B.L., Starman, L.A. and Coutu, Jr., R.A., "Self-assembling nanosphere lithography process for gated carbon-nanotube field emission arrays," SPIE Advanced Lithography Symposium, Alternative Lithographic Technologies conference, CA, 21-25 February 2010.

Lake, R.A., Coutu, Jr., R.A. and Starman, L.A., "Electrothermal Actuators for MEMS Safe and Arm Devices," The 11th International Symposium on MEMS and Nanotechnology, SEM Annual Conference, IN, 7-9 June 2010.

Roman, C.T., Starman, L.A. and Coutu, Jr., R.A., "Thermal Metamaterials," The 11th International Symposium on MEMS and Nanotechnology, SEM Annual Conference, IN, 7-9 June 2010.

Langley, D., Coutu, Jr., R.A. and Starman, L.A., "MEMS integrated metamaterial structure capable of variable resonance for RF applications," The 11th International Symposium on MEMS and Nanotechnology, SEM Annual Conference, IN, 7-9 June 2010.

Lundell, C.A., Paul, J.V, Collins, P.J, Coutu, Jr., R.A. and Starman, L.A., "RF testing of a MEMS integrated metamaterial structure capable of variable resonance," The 11th International Symposium on MEMS and Nanotechnology, SEM Annual Conference, IN, 7-9 June 2010.

Crossley B.L., Coutu, Jr., R.A., Starman, L.A. and Collins, P.J., "Characterization of an Optimized Carbon Nanotube Field Emission Array," The 11th International Symposium on MEMS and Nanotechnology, SEM Annual Conference, IN, 7-9 June 2010.

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

SPONSOR FUNDED RESEARCH PROJECTS

"Integrated Precision Ordnance Delivery System." Sponsor: DTRA. Funding: \$95,000. [ANT]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Sitzabee, W. E. and Stepaniak, M. J., "Mission Assurance Issues with the Federal Aviation Administration's Policy to Implement GPS Navigational System," International Conference on Security and Management (SAM), Las Vegas, NV, July 2010.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Stepaniak, M. J., "Development of a Quadrotor Sensor and Navigation Platform," Miniature Autonomous Systems Workshop, Ft. Walton Beach, FL, Oct 2009.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Academic advisor, 2009 USAF Test Pilot School (TPS) selection board, Randolph AFB, TX.

Stepaniak, M. J., "Positioning, Navigation, and Timing Challenges for Unmanned Aerial Vehicles," Sensor Symposium, Dayton, OH, June 2010 (invited presentation).

Technical Reviewer, IEEE Transactions on Aerospace and Electronic Systems.

Chairman, Dayton Section, Institute of Navigation (ION).

Secretary and founding officer, Wright Chapter, Society of Flight Test Engineers (SFTE) (chartered December 2009).

Member, Institute of Electrical and Electronics Engineers (IEEE).

Member, Association of Old Crows (AOC).

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

SPONSOR FUNDED RESEARCH PROJECTS

“Phase II Support: RF-EW Systems.” Sponsor: NSA. Funding: \$100,000.

“Phase III Support: RF-EW Systems.” Sponsor: AFRL/RV. Funding: \$50,000. [CCR]

“Technical Support: Opportunistic Channel Access.” Sponsor: DOD Laboratory for Telecommunication Sciences. Funding: \$52,322. [CCR]

REFEREED JOURNAL PUBLICATIONS

Chakravarthy, Li, Zhou, Wu, and Temple, “Novel Overlay/Underlay CR Waveforms Using SD-SMSE Framework to Enhance Spec Eff – Part II: Analysis in Fading Channels,” *IEEE Trans on Comm*, 58:6: 1342-1351, Jun 2010.

Klein, Temple, and Mendenhall, “Application of Wavelet Denoising to Improve OFDM-Based Signal Detection and Classification,” *Jour. of Security and Communication Networks*, 3:1:71-82, Mar 10.

Reising, Temple, and Mendenhall, “Improved Wireless Security for GMSK-Based Devices Using RF Fingerprints,” *Int’l Jour. of Electronic Security and Digital Forensics (IJESDF)*, 3:1:41-59, Mar 10.

Chakravarthy, Li, Wu, Temple, Shaw, and Garber, “Novel Overlay/Underlay CR Waveforms Using SD-SMSE Framework to Enhance Spectrum Efficiency – Part I,” *IEEE Trans on Comm*, 57:12:3794-3804, Dec 09.

Klein, Temple, and Mendenhall, “Application of Wavelet-Based RF Fingerprinting to Enhance Network Security,” *Jour. of Communications and Networks–Special Issue: Secure Wireless Networking*, 11:6:544-555, Dec 09.

Like, Temple, and Wu, “SMSE Waveform Design Using SD Selection and Dynamic Assignment of Subcarrier Mod Order and Power,” *Jour. of Communications–Special Issue: CR Enabled Comm and Nets*, 4:10:766-780, Nov 09.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Williams, Munns, Temple, and Mendenhall, “RF-DNA Fingerprinting for Airport WiMax Communications Security,” 4th Int’l Conf on Network and System Security (NSS10), Sydney Australia, Sep 10.

Kuciapinski, Temple, and Klein “Anova-Based RF DNA Analysis: Identifying Significant Params for Device Classification,” *Int’l Conf on Wireless Info Nets and Sys (WINSYS 2010)*, Athens Greece, Jul 2010.

Like, Temple and Wu, “Soft Decision Design of Spectrally Partitioned CI-SMSE Waveforms for Coexistent Applications,” *2010 IEEE Int’l Conf on Comm (ICC10)*, Cape Town, South Africa, May 10.

Li, Like, Wu and Temple, “Highly Accurate Blind Carrier Frequency Offset Estimator for Mobile OFDM Systems,” *2010 IEEE Int’l Conf on Comm (ICC10)*, Cape Town, South Africa, May 10.

Like, Temple and Wu, “Spectrally-Temporally Adapted SMSE Waveform Design Using Imperfect Channel Estimates,” *IEEE Wireless Comm and Networking Conf (WCNC 2010)*, 38% Sel Rate, Sydney, Australia, Apr 10.

Reising, Temple and Mendenhall, “Improving Intra-Cellular Security Using Air Monitoring with RF Fingerprints,” *IEEE Wireless Comm and Networking Conf (WCNC 2010)*, 38% Sel Rate, Sydney, Australia, Apr 10.

Woelfle, Temple, Mullins and Mendenhall, "Analyzing Bluetooth RF Fingerprints in Support of RF Intelligence Missions," 2009 Military Communications Conf (MILCOM 2009), Boston, MA, Oct 09.

Birchough, Temple and Mendenhall, "Classifying Emissions From GSM Communication Devices Using Entropy-Based RF Fingerprinting," 2009 Military Communications Conf (MILCOM 2009), Boston, MA, Oct 09.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Temple, "Application of RF DNA Fingerprinting for RFINT," Dr. Tom Peters, Technical Director, Aerospace Data Facility-Colorado (ADF-C), Buckley AFB, CO, Nov 2009.

Temple, "Airport WiMax Security," Mr. Phillip Paulsen, Chief, Earth Science Technology Office, NASA Glenn Research Center (GRC), Cleveland OH, Apr 2010.

Temple, "Cognitive Radio Technologies," Dr. Charles Clancy, Chief, CR Technology Development, Laboratory for Telecommunications Sciences (LTS), College Park, MD, Apr 2010.

Temple, "Using RF DNA Fingerprints as Communication External," Mr. Randolph Stimic, Director, Communications External R&D, Aerospace Data Facility-Colorado (ADF-C), Buckley AFB, CO, May 2010.

Program Reviewer: DOE, Nuclear Nonproliferation Verification Research and Engineering Program.

Technical Reviewer: Various IEE and IEEE journals, transaction, conferences.

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 New Jersey. He is an active officer of IEEE, and a fellow of the Electromagnetics Academy. Tel. 937-255-3636 x4717 (DSN 785-3636 x4717), email: Andrew.Terzuoli@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

"Electron Device Simulation." Sponsor: AFRL/RV. Funding: \$20,000.

"Remote Sensing and Communications for Advanced Technical Exploitation." Sponsor: NASIC. Funding: \$125,000.

"RF Sensing for Small Unmanned Aerial Systems (SUAS)." Sponsor: AFRL/RV. Funding: \$54,675.

REFEREED JOURNAL PUBLICATIONS

R. J. Barton, P. J. Collins, P. E. Crittenden, M. J. Havrilla, A. J. Terzuoli, "Analytical Development of the Far Zone Radiation Integral for an Arbitrary Planar Spiral Antenna," IEEE Magazine, Antennas, and Propagation, Vol 52, No 2, April 2010, Invited Paper.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

- J. E. McGowan, S. C. Gustafson, J. A. Jackson, A. J. Terzuoli Jr., "The Effect of Synthetic Aperture Radar Image Resolution on Target Discrimination," SPIE Defense, Security, and Sensing Proceedings, Orlando, Florida, 5-9 April 2010.
- N. A. Estep, J. C. Petrosky, Y. C. Kim, J. W. McClory, A. J. Terzuoli, Jr., "Combined Effects of Electromagnetic Interference (EMI) and Ionizing Radiation on Digital Inverters," Hardened Electronics And Radiation Technology Conference Proceedings, Tucson, AZ, 19-23 April 2010.
- R. I. Barnes, G. Earl, M. Papazoglou, L. Burchett, A. J. Terzuoli, Jr., "The Instagram: A Novel HF Sounding Technique for Enhanced Propagation Advice," IEEE International Radar Conference Proceedings, Washington DC, 10-14 May 2010.
- N. A. Estep, J. C. Petrosky, Y. C. Kim, J. W. McClory, A. J. Terzuoli, Jr., "Combined Effects of Electromagnetic Interference (EMI) and Ionizing Radiation on Digital Inverters," IEEE Nuclear and Space Radiation Effects Conference (NSREC) Proceedings, Denver, Colorado, 19-23 July 2010.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

- A. Schmitt, P. J. Collins, S. K. Rogers, A. J. Terzuoli, Jr., "Noise Radar Correlation Patterns of Human And Non-Human Objects At Various Look Angles," 31st Annual AMTA Symposium Proceedings, Salt Lake City UT, 1-6 November 2009.
- L. Weidenhammer, A. Miranda, A. J. Terzuoli, Jr., "Polyhedron Geometric Characterization & Optimization for Multi-Static OTHR," Air Force Orbital Resources Ionosphere (ORION) Conference Proceedings, Dayton, OH, 13-15 January 2010.
- L. Burchett, J. Cetnar, D. Chick, A. J. Terzuoli, Jr., "Testing and Deployment of Advanced Direct Digital HF Transmitter and Receivers," Air Force Orbital Resources Ionosphere (ORION) Conference Proceedings, Dayton, OH, 13-15 January 2010.
- D. Chick, J. Cetnar, A. J. Terzuoli, Jr., "Next Generation Over-the-Horizon Radar Antennas," Air Force Orbital Resources Ionosphere (ORION) Conference Proceedings, Dayton, OH, 13-15 January 2010.
- M. Massar, G. Taylor, D. York, E. Dye, L. Weidenhammer, L. Burchett, J. Cetnar, A. Flory, D. Bricker, A. J. Terzuoli, Jr., "AFIT-WPMDC EM Remote Sensing & Communications Projects," MASINT Process Exploitation & Dissemination (PED) Conference Record, Dayton, OH, 12-16 April 2010.
- M. E. Arriagada, M. A. Saville, A. J. Terzuoli, Jr., "Scattering Matrix Decomposition and Color Spaces Performance for Synthetic Aperture Radar Imagery," International Society for Photogrammetry and Remote Sensing (ISPRS) Commission VII Symposium Proceedings, Vienna, Austria, 5-7 July 2010.
- J. E. McGowan, S. C. Gustafson, J. A. Jackson, R. K. Martin, A. J. Terzuoli Jr., "Synthetic Aperture Radar Image Resolution Effect on Target Discrimination," ISPRS Commission VII Symposium Proceedings, Vienna, Austria, 5-7 July 2010.
- M. E. Arriagada, M. A. Saville, A. J. Terzuoli, Jr., "Performance of Scattering Matrix Decomposition and Color Spaces for Synthetic Aperture Radar Imagery," 38th Committee on Space Research (COSPAR) Scientific Assembly Proceedings, Bremen, Germany, 18-25 July 2010.
- J. E. McGowan, S. C. Gustafson, J. A. Jackson, R. K. Martin, A. J. Terzuoli Jr., "The Effect of Synthetic Aperture Radar Image Resolution on Target Discrimination," 38th COSPAR Scientific Assembly Proceedings, Bremen, Germany, 18-25 July 2010.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Member Association of Old Crows (AOC).

IEEE Senior Member.

Member of Sigma Xi, Tau Beta Pi (TBP), Eta Kappa Nu (HKN), and numerous DOD working groups.

Paper reviewer for IEEE Trans. on Geoscience and Remote Sensing.

Formal STEM Recruiting.

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REFEREED JOURNAL PUBLICATIONS

R. Komali, R. Thomas, L. DaSilva and A. MacKenzie. The Price of Ignorance: Distributed Topology Control
in Cognitive Networks, IEEE Transactions on Wireless Communications, April 2010.

R. Martin and R. Thomas, Algorithms and Bounds for Estimating Location, Directionality, and
Environmental Parameters of Primary Spectrum Users, IEEE Transactions on Wireless Communications,
Dec 2009.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

A. Gross, R. Thomas, R. Martin and M. Silvius, Handshaking Protocols and Jamming Mechanisms for Blind
Rendezvous in a DSA Environment, in Proc of Wireless@VT Symposium 2010, June 2010.

R. Thomas, R. Komali, B. Borghetti and P. Mahonen, A Bayesian Game Analysis of Emulation Attacks in
Dynamic Spectrum Access Networks, in Proc of IEEE DySPAN 2010, April 2010.

A. Honore, R. Thomas, R. Martin, and S. Kurkowski Implementation of Collaborative RF Localization Using
a Software-Defined Radio Network, in Proc of IEEE MILCOM 2009, October 2009.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

R. Thomas, "Cognitive Networks," presented to Wright State University EE736, May 2010.

R. Thomas, "Game Theory for Cognitive Radio Jamming," presented to University at Buffalo Networking
Colloquium, January 2010.

AFOSR/RSL Technical Interchange, invited technical expert, May 2010.

The Technical Cooperation Program Software Defined Radio Radar, invited expert, Oct. 2009.

Invited Panelist NSF NeTS 2010.

Technical Program Committee Member IEEE ICC 2010.

TRIAS, ERIC D., Maj,

Assistant Professor of Computer Science, Department of Electrical and Computer Engineering, AFIT
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SPONSOR FUNDED RESEARCH PROJECTS

"Information Operations and Security Using Non-Cryptographic Solutions." Sponsor: AFOSR. Funding:
\$34,916.

REFEREED JOURNAL PUBLICATIONS

Maj Eric Trias and Capt Bryan Bell, "Cyber This, Cyber That. So What?" Air and Space Power Journal vol.
24, no. 1 Spring 2010, pp. 91-100.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

J. McDonald, E.Trias, Y. Kim, and M. Grimala "Using Logic-Based Reduction for Adversarial Component
Recovery," Proceedings of the 2010 ACM Symposium on Applied Computing, Sierre, Switzerland. Vol 3,
pp. 1993-2000, Mar 2010.

L. Isaly, E.Trias, and B. Peterson. "Improving the Latent Dirichlet Allocation Document Model with
WordNet," Proceedings of the 5th International Conference on Information Warfare and Security, Dayton,
OH, pp. 163-170, Mar 2010.

W.Henry, J. Stange, and E.Trias. "Pearl Harbor 2.0: When Cyber-Acts Lead to the Battlefield," Proceedings
of the 5th International Conference on Information Warfare and Security, Dayton, OH, pp. 148-153, Mar
2010.

B. Fryer, K. Merritt, and E.Trias. "Security in the Emerging African Broadband Environment," Proceedings
of the 5th International Conference on Information Warfare and Security, Dayton, OH, pp. 98-105, Mar
2010.

D. Bares, E. Trias, and R. Mills. "A Tactical Framework for Cyberspace Situational Awareness," 15th
International Command and Control Research and Technology Symposium, Santa Monica, CA, Jun 2010.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Panelist, DOD SMART scholarship selection committee.

Program Committee member, International Conference on Information Warfare (ICIW) 2010.

Co-editor, Journal of Defense Modeling and Simulation Special Issue on Cyber.

Reviewer for Military Communications Conference 2010.

Reviewer for Cloud Computing Conference 2010.

Reviewer for Computer Communications Journal 2010.

Reviewer for ICIW 2010.

Reviewer, Air and Space Power Journal, 2010.

VETH, MICHAEL J., Lt Col,

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SPONSOR FUNDED RESEARCH PROJECTS

“Architecture Trade Study and Simulations on the Integratin of Atom-Optic Inertial Technology with GPS and the Integration with Auxiliary Inertial Technology.” Sponsor: AFRL/RV. Funding: \$29,500. [ANT]

“Multi-Sensor Collection for Vision-Based Navigation and Targeting.” Sponsor: Draper Laboratory. Funding: \$80,000. [ANT]

“Synchronized Image-Inertial Data Collection and Processing System: Phase II.” Sponsor: NGA. Funding: \$100,000. [ANT]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

“Sensor Modeling and Sensitivity Analysis for Next Generation Time-Space Position Information (TSPI) System,” Smearcheck, M., Veth, M.J., Zangaro, C., Proceedings of ION International Technical Meeting 2010, San Diego, CA. [ANT]

“Tightly-Coupled Image-Aided Inertial Relative Navigation Using Statistical Predictive Rendering (SPR) Techniques and a Priori World Models,” Beich, J., Veth, M.J., Proceedings of ION/IEEE PLANS2010, May 2010. [ANT]

“Passive Indoor Image-Aided Inertial Attitude Estimation Using a Predictive Hough Transformation,” Borkowski, J.M., Veth, M.J., Proceedings of ION/IEEE PLANS2010, May 2010. [ANT]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

“PNT Challenges for Unmanned Aerial Vehicles” (invited presentation), Veth, M.J., Presented to the 3rd Annual Stanford PNT Symposium, October 2009. [ANT]

“Passive Indoor Image-Aided Inertial Attitude Estimation Using a Predictive Hough Transformation,” Borkowski, J.M., Veth, M.J., Proceedings of JSDE Joint Navigation Conference, June 2010. [ANT]

“Laser-Aided Monocular Image Navigation for Embedded Applications,” Yates, D. J., Veth, M.J., Proceedings of JSDE Joint Navigation Conference, June 2010. [ANT]

“Fusion of OFDM Signals of Opportunity and Inertial Sensors for Unassisted Navigation,” J. Crosby, R. K. Martin, J. Raquet, and M. Veth, Joint Navigation Conference (JNC), June 2010. [ANT]

Served as President of the Institute of Navigation, Dayton Chapter 2008-2009. [ANT]

Session chair, ION GNSS 2010. [ANT]

Session chair, ION/JSDE JNC 2010. [ANT]

Instructor, Alternative Navigation Short Course, ION/JSDE JNC 2010. [ANT]

Track chair, ION/IEEE PLANS 2010. [ANT]

Judge, ION Autonomous Lawnmower Competition, 2010. [ANT]

Reviewer, Journal of the Institute of Navigation, 2010. [ANT]

Reviewer, International Journal of Micro Air Vehicles, 2010. [ANT]

Instructor, Image-aided Inertial Navigation Short Course, ION/IEEE PLANS 2010. [ANT]

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5.3.1	<u>DOCTORAL DISSERTATIONS</u>	119
5.3.2	<u>MASTER'S THESES</u>	119
5.3.3	<u>FACULTY RESEARCH OUTPUT</u>	122

5.3.1. DOCTORAL DISSERTATIONS

BARGER, LUKE A., *The Scattering Matrix Elements of the Nonadiabatic Collision*. AFIT/DS/ENP/10-S02. Faculty Advisor: Dr. David E. Weeks. Sponsor: AFOSR.

BRADLEY, KENNETH C., *Midwave Infrared Imaging Fourier Transform Spectrometry of Combustion Plumes*. AFIT/DS/ENP/09-S01. Faculty Advisor: Dr. Glen P. Perram. Sponsor: NASIC.

DAVIS, BRIAN S., *Time Dependent Channel Packet Calculation of Two Nucleon Scattering Matrix Elements*. AFIT/DS/ENP/10-M03. Faculty Advisor: Dr. David E. Weeks. Sponsor: AFTAC.

MILLER, TY E., *Early Time Characterization of Fresh Nuclear Debris Using Gamma Spectroscopy*. AFIT/DS/ENP/10-S04. Faculty Advisor: Dr. Charles J. Bridgman. Sponsor: DHS/DNDO.

PITZ, GREG A., *Collisional Dynamics of the Cesium D1 and D2 Transitions*. AFIT/DS/ENP/10-S045. Faculty Advisor: Dr. Glen P. Perram. Sponsor: HELJTO.

SCHUMER, EVELYN A., *Improved Modeling of Midlatitude D-region Ionospheric Absorption of High Frequency Radio Signals during Solar X-ray Flares*. AFIT/DS/ENP/09-J01. Faculty Advisor: Dr. William Bailey. Sponsor: AFOSR/NE.

SULHAM, CLIFFORD V., *Laser Demonstration and Performance Characterization of an Optically Pumped Alkali Laser System*. AFIT/DS/ENP/10-S06. Faculty Advisor: Dr. Glen P. Perram. Sponsor: HELJTO.

WAGNER, TORREY J., *All Solid-State Mid-IR Laser Development, Nonlinear Absorption Investigation and Laser-Induced Damage Study*. AFIT/DS/ENP/10-S07. Faculty Advisor: Dr. Robert L. Hengehold. Sponsor: AFRL/RV.

WILLIAMS, CHRISTOPHER S., *Three Dimensional Positron Annihilation Momentum Measurement Technique (3DPAMM) Applied to Measure Oxygen-Atom Defects in 6H Silicon Carbide*. AFIT/DS/ENP/10-M02. Faculty Advisor: Dr. Larry W. Burggraf. Sponsor: AFOSR/NL, DTRA, & DHS.

WOOTEN, DAVID J., *Electronic Structure of Lithium Tetraborate*. AFIT/DS/ENP/10-J01. Faculty Advisor: LTC John W. McClory. Sponsor: DTRA.

5.3.2. MASTER'S THESES

ANDERSON, JOEL R., *Monocular Passive Ranging by an Optical System with Band Pass Filtering*. AFIT/GAP/ENP/10-M01. Faculty Advisor: Dr. Glen P. Perram. Sponsor: NASIC.

BAUER, WILLIAM A., *Determination of Nuclear Yield from Thermal Degradation of Automobile Paint*. AFIT/GNE/ENP/10-M11. Faculty Advisor: Dr. Larry W. Burggraf. Sponsor: DTRA.

BERGSTROM, AUSTIN C., *Optical and Electrical Characterization of Bulk Grown Indium-Gallium-Arsenide Alloys*. AFIT/GAP/ENP/10-M02. Faculty Advisor: Dr. Yung Kee Yeo. Sponsor: AFOSR/RS.

BOWERS, JAMES C., *Numerical Investigation of Statistical Turbulence Effects on Beam Propagation through 2-D Shear Mixing Layer*. AFIT/GAP/ENP/10-M03. Faculty Advisor: Dr. Steven T. Fiorino. Sponsor: HELJTO.

BOYCE, NATHAN O., *Thermal Neutron Point Source Imaging using a Rotating Modulation Collimator (RMC)*. AFIT/GNE/ENP/10M-01. Faculty Advisor: Capt Benjamin R. Kowash. Sponsor: DTRA.

BUTLER, SAMUEL D., *Calculation of Collisional Cross Sections for the $^2P_{3/2} \rightarrow ^2P_{1/2}$ Transition in Alkali-Noble Gas Systems*. AFIT/GAP/ENP/10-M04. Faculty Advisor: Dr. David E. Weeks. Sponsor: HELJTO.

COY, DAVID F., *Changes to Electrical Conductivity in Irradiated Carbon-Nickel Nanocomposites*. AFIT/GNE/ENP/10M-02. Faculty Advisor: Dr. James C. Petrosky. Sponsor: N/A.

DANIEL, JOSHUA D., *The Combined Effects of Radio Frequency and Gamma Irradiation on P-Channel MOSFETs*. AFIT/GNE/ENP/10-S01. Faculty Advisor: Dr. James C. Petrosky. Sponsor: AFRL/RD.

ELLIOTT, BRIAN P., *Evaluation of Interplanetary Magnetic Field Tracing Models Using Impulsive SEPs*. AFIT/GAP/ENP/10-M05. Faculty Advisor: Lt Col Ariel O. Acebal. Sponsor: NASA.

HACKETT, SHAWN W., *Simulation of a Diode Pumped Alkali Laser, A Three Level Numerical Approach*. AFIT/GAP/ENP/10-M06. Faculty Advisor: Lt Col Jeremy C. Holtgrave. Sponsor: HELJTO.

HAIDUCEK, JOHN D., *Experimental Validation Techniques for the HELEEOS Off-Axis Laser Propagation Model*. AFIT/GAP/ENP/10-M07. Faculty Advisor: Dr. Steven T. Fiorino. Sponsor: NSF-NCMR.

HAMBLÉN, STEWART S., *A Physics Based Analytical Model for the Near Field Electromagnetic Pulse Generated by a Surface Nuclear Detonation*. AFIT/GNE/ENP/10-M04. Faculty Advisor: Dr. James C. Petrosky. Sponsor: DTRA.

HANSEN, LEIF A., *An Evaluation of a Networked Radiation Detection System*. AFIT/GWM/ENP/10-M02. Faculty Advisor: Lt Col David A. Smith. Sponsor: US EPA.

HARRIS, THOMAS R., *Optical Properties of Si, Ge, GaAs, GaSb, InAs, and InP at Elevated Temperatures*. AFIT/GAP/ENP/10-M08. Faculty Advisor: Dr. Yung Kee Yeo. Sponsor: AFRL/RX.

HERR, NICHOLAS C., *AFM-Patterned 2-D Thin-Film Photonic Crystal Analyzed by Complete Angle Scatter*. AFIT/GMS/ENP/10-M01. Faculty Advisor: Dr. Larry W. Burggraf. Sponsor: AFRL/RX.

KLEINSCHMIDT, NEAL B., *The Material Properties of CsSnBr₃ and CsBr:Sn_{1%} and Their Potential as Scintillator Detector Material*. AFIT/GNE/ENP/10-M05. Faculty Advisor: Capt Benjamin R. Kowash. Sponsor: DTRA.

LaROCHE, BRANDON C., *Analysis of Expedient Field Decontamination Methods for the XM/2L-MIL High-Volume Aerosol Sampler*. AFIT/GWM/ENP/09-D01. Faculty Advisor: Lt Col David A. Smith. Sponsor: 711 HPW/RH.

MACDONALD, DOUGLAS J., *Passive Ranging Using Infra-Red Atmospheric Attenuation*. AFIT/GAP/ENP/10-M09. Faculty Advisor: Lt Col Michael R. Hawks. Sponsor: NASIC.

MEIER, DAVID C., *Application of Satellite-Derived Wind Profiles to Joint Precision Airdrop System (JPADS) Operations*. AFIT/GAP/ENP/10-M10. Faculty Advisor: Dr. Steven T. Fiorino. Sponsor: DET 3, 16 WS & 516 AESW/XR.

MIKINA, JANUSZ K., *In-situ, Gate Bias Dependent Study of Neutron Irradiation Effects on AlGaIn/GaN HFETs*. AFIT/GNE/ENP/10M-06. Faculty Advisor: LTC John W. McClory. Sponsor: DTRA.

MILLER, WOODY S., *Rubidium Recycling in a High Intensity Short Duration Pulsed Alkali Laser*. AFIT/GAP/ENP/10-M11. Faculty Advisor: Lt Col Jeremy C. Holtgrave. Sponsor: HELJTO.

O'DELL, DANIEL C., *Development and Demonstration of a Field-Deployable Fast Chromotomographic Imager*. AFIT/GEO/ENP/10-M01. Faculty Advisor: Lt Col Michael R. Hawks. Sponsor: N/A.

RANNEY, DANE P., *Realistic Vertical Atmospheric Profiles and Effects from Limited Surface Observations*. AFIT/GAP/ENP/10-M12. Faculty Advisor: Dr. Steven T. Fiorino. Sponsor: SDL.

SCHULER, WESLEY A., *Nuclear Forensics: Measurements of Uranium Oxides Using Time-of-Flight Secondary Ion Mass Spectrometry (TOF-SIMS)*. AFIT/GWM/ENP/10-M03. Faculty Advisor: Dr. Larry W. Burggraf. Sponsor: N/A.

SLAUGHTER, ROBERT C., *Positron Annihilation Ratio Spectroscopy (PsARS) Applied to Positronium Formation Studies*. AFIT/GNE/ENP/10-M07. Faculty Advisor: Dr. Larry W. Burggraf. Sponsor: AFRL/RW.

SNYDER, JOHN M., *Improving Low Order, Linear, Positive Spatial Quadratures for the Partial Current Neutron Transport Method*. AFIT/GNE/ENP/10M-08. Faculty Advisor: Dr. Kirk A. Mathews. Sponsor: N/A.

SPIDELL, MATTHEW T., *High Speed Thermal, Radius, and Emissivity Measurements of Ammonia Nitrate Detonation Fireballs*. AFIT/GAP/ENP/10-M14. Faculty Advisor: Dr. Kevin C. Gross. Sponsor: N/A.

THORNTON, DOUGLAS E., *Hard Collisions in Rubidium using Sub-Doppler Spectroscopy*. AFIT/GEO/ENP/10-M02. Faculty Advisor: Dr. Glen P. Perram. Sponsor: HELJTO.

TRAN, KHOI D., *Uncertainty Quantification of Multi-Component Isotope-Separation Cascade Model*. AFIT/GNE/ENP/10-M09. Faculty Advisor: Dr. Kirk A. Mathews. Sponsor: N/A.

YOUNG, ANTHONY M., *Scene Change Artifacts In Fourier Transform Spectroscopy Of Temporally Changing Sources*. AFIT/GAP/ENP/10-M16. Faculty Advisor: Dr. Kevin C. Gross. Sponsor: NASIC.

YOUNG, CHRISTOPHER M., *Gadolinium Oxide/Silicon Thin Film Heterojunction Solid-State Neutron Detector*. AFIT/GNE/ENP/10M-10. Faculty Advisor: LTC John W. McClory. Sponsor: DHS/DNDO.

5.3.3. FACULTY RESEARCH OUTPUT

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

ACEBAL, ARIEL O., Lt Col,

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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. Dr. Bailey's research interests center on weakly ionized gases and reactive kinetics with special applications to semiconductor processing in gas discharges, shock characterization in ionized flows, and solutions of the inhomogeneous electron kinetic equation. Dr. Bailey has published 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

SPONSOR FUNDED RESEARCH PROJECTS

"Numerical Solutions of the Kinetic Equation." Sponsor: AFRL/RB. Funding: \$34,000.

REFEREED JOURNAL PUBLICATIONS

Williams, Skip, Givens, Ryan, Lindstrom, Chad, Davis, Doug, Tam, Chung-Jen, and Bailey, William, "Multiple Line-of-Sight Absorption Spectroscopy of a Supersonic Shock Train Part I: System Design, Validation, and Mach 2 Flow Results," *AIAA Journal*, Vol. 47, No.10, pp. 2368-2378, October 2009. [CDE]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Josyula, E., Vedula, P., Bailey, W.F., and Suchyta, III, C.J., "Numerical Solution of the Boltzmann Equation for a Non-Reactive Gas Mixture," paper published in Proceedings of the 27th International Rarefied Gas Dynamics Symposium, Pacific Grove, CA, 10-15 July 2010.

Josyula, E., Vedula, P., and Bailey, W.F., "Kinetic Solution of Shock Structure in a Non-Reactive Gas Mixture," 48th AIAA Aerospace Sciences Meeting, Orlando, FL, 4-7 January 2010, AIAA Paper 2010-817.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Josyula, E., Vedula, P., Bailey, W.F., and Suchyta, III, C.J., "Numerical Solution of the Boltzmann Equation for a Non-Reactive Gas Mixture," 27th International Rarefied Gas Dynamics Symposium, Pacific Grove, CA, 10-15 July 2010.

Josyula, E., Vedula, P., and Bailey, W.F., "Kinetic Solution of Shock Structure in a Non-Reactive Gas Mixture," 48th AIAA Aerospace Sciences Meeting, Orlando, FL, 4-7 January 2010, AIAA 2010-817.

BICKLEY, ABIGAIL A.,

Research Assistant Professor, Department of Engineering Physics, AFIT Appointment Date: 2010 (AFIT/ENP); BA, Dartmouth College, 2000; PhD, University of Maryland, 2004. Dr. Bickley's research focuses on the application of nuclear chemistry and physics to problems relevant to the field of nuclear forensics through the development of novel detection systems. She is the author of over 60 archival publications in refereed journals. Before joining AFIT, she was a faculty member for three years in the Department of Chemistry and National Superconducting Cyclotron Laboratory at Michigan State University. Her current work includes studies of solid-state semiconductor materials for detecting neutrons with applications towards detecting special nuclear materials. She is a member of the American Physical Society, American Nuclear Society, and American Chemical Society. Tel. 937-255-3636 x4586 (DSN 785-3636 x4586), email: Abigail.Bickley@afit.edu

REFEREED JOURNAL PUBLICATIONS

Adare, A., *et al.*, "Azimuthal anisotropy of neutral pion production in Au+Au collisions at $\sqrt{s_{NN}} = 200$ GeV: Path-length dependence of jet quenching and the role of initial geometry," *Physical Review Letters*, Vol. 105, article no. 142301, 27 September 2010.

Adare, A., *et al.*, "Elliptic and hexadecapole flow of charged hadrons in Au+Au collisions at $\sqrt{s_{NN}} = 200$ GeV," *Physical Review Letters*, Vol. 105, article no. 062301, 4 August 2010.

Adare, A., *et al.*, "Transverse momentum dependence of eta meson suppression in Au+Au collisions at $\sqrt{s_{NN}} = 200$ GeV," *Physical Review C*, Vol. 82, article no. 011902, 27 July 2010.

Adare, A., *et al.*, "Transverse momentum dependence of J/psi polarization at mid-rapidity in p+p collisions at $\sqrt{s}=200$ GeV," *Physical Review D*, Vol. 82, article no. 012001, 7 July 2010.

Adare, A., *et al.*, "Transition in yield and azimuthal shape modification in dihadron correlations in relativistic heavy ion collisions," *Physical Review Letters*, Vol. 104, article no. 252301, 21 June 2010.

Alver, B., *et al.*, "Event-by-event fluctuations of azimuthal particle anisotropy in Au+Au collisions at $\sqrt{s_{NN}}=200$ GeV," *Physical Review Letters*, Vol. 104, pp. 142301-1 to 142301-5, April 2010.

Alver, B., *et al.*, "Non-flow correlations and elliptic flow fluctuations in Au+Au collisions at $\sqrt{s_{NN}}=200$ GeV," *Physical Review C*, Vol. 81, pp. 034915-1 to 034915-8, March 2010.

Adare, A., *et al.*, "Detailed measurement of the e+e- pair continuum in p+p and Au+Au collisions at $\sqrt{s_{NN}}=200$ GeV and implications for direct photon production," *Physical Review C*, Vol. 81, pp. 034911-1 to 034911-56, March 2010.

Adare, A., *et al.*, "Enhanced production of direct photons in Au+Au collisions at $\sqrt{s_{NN}}=200$ GeV," *Physical Review Letters*, Vol. 104, pp. 132301-1 to 132301-6, March 2010.

BOREL-DONOHUE, CHRISTOPH C.,

Research Associate Professor, Department of Engineering Physics, AFIT Appointment Date: 2010 (AFIT/ENP); Dipl. Ing ETH, Swiss Federal Institute of Technology, Zurich, Switzerland, 1981; PhD, University of Massachusetts, 1988. Professor Borel's research focuses on visible through thermal hyperspectral data analysis; atmospheric correction; temperature-emissivity separation; Bidirectional Reflectance Distribution Function (BRDF) modeling; adjoint radiosity methods to retrieve reflectance in complex environments; spatial/spectral sharpening and data fusion; Fourier transform spectrometer imaging; atmospheric correction of satellite imagery; scene simulation in the visible and infrared using computer graphics; end-to-end modeling of hyperspectral sensors; and top of atmosphere albedo of the earth. At AFIT, he continues work in the hyperspectral thermal area but is also involved in analyzing video to extract gait information and tracking moving vehicles in persistent surveillance data. Before joining AFIT, he was a technical staff member at the Los Alamos National Laboratory for 17 years and worked at Ball Aerospace for 5 years. He is a senior member of IEEE and a member of SPIE. Tel. 937-255-3636 x4957 (DSN 785-3636 x4957), email: Christoph.Borel@afit.edu

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Borel, Christoph C., and Tuttle, Ronald F., “Improving the detectability of small spectral targets through spatial filtering,” *Proceedings of SPIE*, Vol. 7812, pp. 78120K, 2010. [CMSR]

Gross, Kevin C., Borel, Chris, White, Allen, Sakai, Stephen, DeVasher, Rebecca, and Perram, Glen P., “First imaging Fourier-transform spectral measurements of detonation in an internal combustion engine,” *Proceedings of SPIE*, Vol. 7812, pp. 78120J, 2010.

Borel, Christoph C., Tuttle, Ronald F., and Spencer, Clyde, “Improved panchromatic sharpening of multi-spectral image data,” *Proceedings of SPIE*, Vol. 7812, pp. 78120G, 2010. [CMSR]

Gross, Kevin C., Young, Anthony M., Borel, Christoph, Steward, Bryan J., and Perram, Glen P., “Simulating systematic scene-change artifacts in Fourier-transform spectroscopy,” *Proceedings of SPIE*, Vol. 7695, pp. 76951Y, 2010. [CMSR]

Borel, Christoph C., McGrellis, Robert, Juhl, Jonathan, and Tuttle, Ronald F., “Automatic processing of gait video and extraction of features,” paper published in Proceedings of BAMS/ASTS, Laurel, MD, 31 August – 2 September 2010. [CMSR]

Walford, Graham V., Bogard, James S., Gunning, John E., Krichinsky, Alan M., Lewis, Linda A., Smith, Steven E., Gross, Kevin C., Borel, Christoph C., Perram, Glen P., Farley, Vincent, Villemaire, Andre, Lux, Gary D., and Patterson, John E., “Enhancing Nuclear Non Proliferation Monitoring by Overlaying Nuclear, Infrared Hyper Spectral FTIR Imaging and Optical Imaging/Scanning Detection Technologies,” paper published in Proceedings of the INMM 51st Annual Meeting, 11-15 July 2010. [CMSR]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Borel, Christoph C., McGrellis, Robert, Juhl, Jonathan, and Tuttle, Ronald F., “Automatic processing of gait video and extraction of features,” talk presented at the BAMS/ASTS meeting, Laurel, MD, 31 August – 2 September 2010. [CMSR]

Walford, Graham V., Bogard, James S., Gunning, John E., Krichinsky, Alan M., Lewis, Linda A., Smith, Steven E., Gross, Kevin C., Borel, Christoph C., Perram, Glen P., Farley, Vincent, Villemaire, Andre, Lux, Gary D., and Patterson, John E., “Enhancing Nuclear Non Proliferation Monitoring by Overlaying Nuclear, Infrared Hyper Spectral FTIR Imaging and Optical Imaging/Scanning Detection Technologies,” talk presented at the INMM 51st Annual Meeting, 11-15 July 2010. [CMSR]

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 textbook, “Introduction to the Physics of Nuclear Weapons Effects,” and 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

BURGGRAF, LARRY W.,

Professor of Engineering Physics and Chemical Physics, Department of Engineering Physics, AFIT Appointment Date: 1994 (AFIT/ENP); BA, Chemistry, Olivet Nazarene University, 1968; MS, Chemistry, The Ohio State University, 1971; MA, Applied Mathematics, University of West Florida, 1977; PhD, Chemistry, University of Denver, 1981; 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 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

SPONSOR FUNDED RESEARCH PROJECTS

"AFIT Support for AFTAC/TM 2010." Sponsor: AFTAC. Funding: \$90,000.

"Chemical Explosive Dynamics and Effects on Bacillus Anthracis." Sponsor: DTRA. Funding: \$201,426.

"Modeling and Measurement of Positron Chemistry: Application to Clusters and Defects." Sponsor: AFOSR. Funding: \$40,000.

REFEREED JOURNAL PUBLICATIONS

Williams, C.S., Baker, W.P., Burggraf, L.W., Adamson, P.E., and Petrosky, J.C., "Toward Simultaneous 2D ACAR and 2D DBAR: Subpixel Spatial Characterization of a Segmented HPGe Detector Using Transient Charges," *IEEE Transactions on Nuclear Science*, Vol. 57, No. 2, pp. 860-869, 2 April 2010.

Duan, X., Wei, J., Burggraf, L., and Weeks, D., "Mapping ground-state properties of silicon carbide molecular clusters using quantum mechanical calculations: Si_mC_n and Si_mC_n^- ($m, n \leq 4$)," *Computational Materials Science*, Vol. 47, pp. 630-644, January 2010.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Sheely, E.V., Burggraf, L.W., Adamson P.E., Duan, X.F., and Schmidt M.W., "Application of GAMESS/NEO to quantum calculations of muonic molecules," *Journal of Physics: Conference Series*, Vol. 225, No. 1, article no. 012049, 25 June 2010.

Williams, C.S., Burggraf, L.W., Adamson, P.E., Petrosky, J.C., and Oxley, M.E., "Simultaneous, Coincident 2-D ACAR and DBAR Using HPGe Detector Incorporating Sub-pixel Interpolation," Advanced Science Research Symposium, *Journal of Physics: Conference Series*, Vol. 225, No. 1, article no. 012058, June 2010.

Williams, C.S., Slaughter, R., Burggraf, L.W., Adamson, P.E., Ross, M., and Petrosky, J.C., "Positron Annihilation Lifetime Spectroscopy of Dodecaborate Cage Molecules in Aqueous Nitrate Solutions," Proceedings of the 2009 IEEE Nuclear Science Symposium and Medical Imaging Conference, Orlando, FL, 25-31 October 2009.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Invited talk on "Oxygen-atom Defects in 6H Silicon Carbide Implanted Using 24 MeV O^{3+} Ions Measured Using Three-dimensional Positron Annihilation Spectroscopy System (3DPASS)," Williams, C.S., Duan, X., Petrosky, J.C., and Burggraf, L.W., presented at the 21st International Conference on the Application of Accelerators in Research and Industry, Fort Worth, TX, 11 August 2010.

Herr, Nicholas, Marciniak, Michael A., Li, Alex G., and Burggraf, Larry W., “Bidirectional reflectance distribution of a 2D thin-film photonic crystal patterned using an atomic-force microscope,” SPIE Optics + Photonics 2010, San Diego, CA, 1-5 August 2010.

Herr, N.C., Marciniak, M.A., Li, A.G., Burggraf, L.W., and Fitzgerald, T.M., “AFM-patterned 2D thin-film polymer photonic crystal analyzed by polarimetric scatterometry,” presented at the International Symposium “Electromagnetic meta-materials” of the Forum on New Materials, part of CIMTEC 2010 – 12th International Ceramics Congress and 5th Forum on New Materials, Montecatini Terme, Tuscany, Italy, 6-18 June 2010.

Burggraf, L.W., Duan, X.F., Roberts, Jr., J.W., and Williams, C.S., “Oxygen Bonding in SiC Clusters and Solid State SiC; Comparisons of Quantum Computations with Positron Spectroscopy,” High Performance Computation Supercomputer Users Group Conference, Chicago, IL, 14 June 2010.

Burggraf, L.W., Williams, C.S., Adamson, P.E., Slaughter, R.C., Ross, M.A., Duan, X.F., and Roberts, J.W., “Applications of Positron Chemistry and Positron Annihilation Spectroscopy at AFIT,” AFOSR Molecular Dynamics Contractor’s Meeting, May 2010.

Kowash, B.R., Rockrohr, R.L., Burggraf, L.W., Petrosky, J.C., and McClory, J., “Estimating Source Position in Sealed Shipping Canisters Using Gamma Ray Spectra from a Portable HPGe Detector,” presented at the 2010 Symposium on Radiation Measurements and Applications, Ann Arbor, MI, 24-28 May 2010.

Li, Alex G., Marciniak, Michael A., and Burggraf, Larry W., “Nano Processing and Characterizing of Polymers Using Atomic Force Microscopy,” 2010 NanoTechnology for Defense Conference, Atlanta, GA, 3-6 May 2010.

CUSUMANO, SALVATORE J.,

Director, Center for Directed Energy, Assistant Professor of Optical Engineering, Department of Engineering Physics, AFIT Appointment Date: 2005 (AFIT/ENP); BS, EE, The United States Air Force Academy, 1971; MS, 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

SPONSOR FUNDED RESEARCH PROJECTS

“Airborne Aero-Optic Laboratory.” Sponsor: HELJTO. Funding: \$150,770. [CDE]

“Airborne Aero-Optic Laboratory.” Sponsor: HELJTO. Funding: \$110,000. [CDE]

“Compensation of Aero-Optical and Atmospheric Disturbances via Coherence Phasing Loops of a Fiber Laser Array.” Sponsor: AFOSR. Funding: \$75,000. [CDE]

“High Energy Laser-Laser Communication Performance Assessment from Remotely-Sensed Measurements of Atmospheric Beam Scatter.” Sponsor: NSF. Funding: \$50,000. [CDE]

“Tactical High Energy Laser Weapon Alignment System Architecture Efficiencies.” Sponsor: HELJTO. Funding: \$174,000. [CDE]

SPONSOR FUNDED EDUCATIONAL PROJECTS

“Lecture Series on Development of Lasers in Defense (Grant).” Sponsor: SPIE LaserFest. Funding: \$5,000. [CDE]

REFEREED JOURNAL PUBLICATIONS

Fiorino, S.T., Bartell, R.J., Krizo, M.J., Caylor, G.L., Moore, K.P., Harris, T.R., and Cusumano, S.J., “Worldwide uncertainty assessments of ladar and radar signal-to-noise ratio performance for diverse low altitude atmospheric environments,” *Journal of Applied Remote Sensing*, Vol. 4, article no. 043533, June 2010. [CDE]

Fiorino, S.T., Bartell, R.J., Krizo, M.J., McClung, B., Cohen, J.J., Randall, R.M., and Cusumano, S.J., “Broad Spectrum Optical Turbulence Assessments from Climatological Temperature, Pressure, Humidity, and Wind,” *Journal of Directed Energy*, Vol. 3, No. 3, pp. 223-238, January 2010. [CDE]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Fiorino, S.T., Randall, R.M., Bartell, R.J., Haiducek, J.D., Spencer, M.F., and Cusumano, S.J., “Field Measurements and Comparisons to Simulations of High Energy Laser Propagation and Off-Axis Scatter,” *Proceedings of SPIE*, Vol. 7814, article no. 781424, SPIE Optics and Photonics, San Diego, CA, August 2010. [CDE]

Spencer, M.F., Cusumano, S.J., Schmidt, J.D., and Fiorino, S.T., “Impact of spatial resolution on thermal blooming phase compensation instability,” *Proceedings of SPIE*, Vol. 7816, article no. 781608, SPIE Optics and Photonics, San Diego, CA, August 2010. [CDE]

Fiorino, S.T., Grice, P.M., Krizo, M.J., Bartell, R.J., Haiducek, J.D., and Cusumano, S.J., “Lab Measurements to Support Modeling Terahertz Propagation in Brownout Conditions,” *Proceedings of SPIE*, Vol. 7671, article no. 767131, SPIE Defense, Security and Sensing Symposium, Orlando, FL, 5-8 April 2010. [CDE]

Fiorino, S.T., Haiducek, J.D., Rice, C.A., Downs, A.D., Krizo, M.J., Bartell, R.J., and Cusumano, S.J., “Field and Laboratory Validation of Surface Layer Optical Turbulence and Off-Axis Irradiance,” *Proceedings of SPIE*, Vol. 7685, article no. 768513, SPIE Defense, Security and Sensing Symposium, Orlando, FL, 5-8 April 2010. [CDE]

Leakeas, C.L., Cusumano, S.J., Krizo, M.J., Bartell, R.J., and Fiorino, S.T., “Effects of Thermal Blooming on Systems Comprised of Tiled Subapertures,” *Proceedings of SPIE*, Vol. 7696B, article no. 7696B40, SPIE Defense, Security and Sensing Symposium, Orlando, FL, 5-8 April 2010. [CDE]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Fiorino, S.T., Randall, R.M., Ranney, D.P., Bartell, R.J., Krizo, M.J., Cusumano, S.J., and Magee, E.P., “Band Model and Surface Observation Input Updates to the LEEDR Atmospheric Characterization Package,” 32nd Review of Atmospheric Transmission Models Meeting, Lexington, MA, 14 June 2010. [CDE]

Magee, E.P., Fiorino, S.T., Randall, R.M., Ranney, D.P., Bartell, R.J., Krizo, M.J., and Cusumano, S.J., “Models for Laser Propagation using Customized LEEDR Atmospheric Characterization,” 32nd Review of Atmospheric Transmission Models Meeting, Lexington, MA, 14 June 2010. [CDE]

Fiorino, S.T., Randall, R.M., Echeverria, F., Bartell, R.J., Krizo, M.J., and Cusumano, S.J., “High Energy Laser Tactical Decision Aid (HELTDA) for Predictive Avoidance,” 5th DEPS Systems Symposium, Monterey, CA, 12-16 April 2010. [CDE]

Fiorino, S.T., Downs, A.D., Bartell, R.J., Krizo, M.J., and Cusumano, S.J., “Three-Dimensional Optical Turbulence Assessments from Doppler Weather Radar for Laser Applications,” 5th DEPS Systems Symposium, Monterey, CA, 12-16 April 2010. [CDE]

Bowers, J., Fiorino, S.T., Cusumano, S.J., and Lofthouse, A., "Numerical Investigation of Statistical Turbulence Effects on Beam Propagation through 2-D Laminar Shear Layer," 5th DEPS Systems Symposium, Monterey, CA, 12-16 April 2010. [CDE]

Leakeas, C.L., Cusumano, S.J., Krizo, M.J., Bartell, R.J., and Fiorino, S.T., "Enhanced Performance Model of Laser Weapon Systems Comprised of Multiple Tiled Subapertures; Turbulence and Thermal Blooming Effects," 5th DEPS Systems Symposium, Monterey, CA, 12-16 April 2010. [CDE]

Cusumano, S.J., Velten, V., Bartell, R.J., Krizo, M.J., and Fiorino, S.T., "Track Algorithm Performance against Tactical Targets in Clutter," 5th DEPS Systems Symposium, Monterey, CA, 12-16 April 2010. [CDE]

McCue, J., Cusumano, S.J., Krizo, M.J., Bartell, R.J., and Fiorino, S.T., "Performance Model of Laser Weapon Systems Comprised of Multiple Tiled Subapertures," Directed Energy Professional Society 12th Annual DE Symposium, San Antonio, TX, 2-6 November 2009. [CDE]

Fiorino, S.T., Bartell, R.J., Krizo, M.J., Haiducek, J., Rice, C., Grice, P., Downs, A., and Cusumano, S.J., "Field and Laboratory Validation of Surface Layer Optical Turbulence, Off-Axis Irradiance, and Desert Sand Optical Properties Models," Directed Energy Professional Society 12th Annual DE Symposium, San Antonio, TX, 2-6 November 2009. [CDE]

FIORINO, STEVEN T.,

Research Associate 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 retrieving environmental parameters via microwave remote sensing; developing signal processing algorithms to fuse meteorological data collection with non-weather ISR platforms; evaluating uncertainty in high-energy laser engagement due to atmospheric effects; and improving microphysical characterizations for nuclear fallout, transport, and dispersion. He has published broadly in meteorological, directed energy, and military journals. Dr. Fiorino is a member of the American Meteorological Society, American Institute of Aeronautics and Astronautics, and 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

SPONSOR FUNDED RESEARCH PROJECTS

"Atmospheric Characterization Tool for LEEDR." Sponsor: Utah State University Research Foundation. Funding: \$4,956. [CDE]

"CY2010 HELJTO M&S TAWG Product Development." Sponsor: AFRL/RD. Funding: \$525,000. [CDE]

"High Energy Laser- Joint Technology Office Contracting Officer Technical Representative." Sponsor: HELJTO. Funding: \$13,900. [CDE]

"Modeling and Simulation Analysis and Education Support for NASIC/DAPM." Sponsor: NASIC. Funding: \$93,000. [CDE]

"Modification of AFIT Atmospheric Effects Software Code for AFRL/RD." Sponsor: AFMC. Funding: \$50,232. [CDE]

SPONSOR FUNDED EDUCATIONAL PROJECTS

"2010 AFIT Center for Directed Energy Summer Intern (DESI) Program." Sponsor: HELJTO. Funding: \$59,513. [CDE]

"Laser Weapon System Short Course." Sponsor: NSWC. Funding: \$18,100. [CDE]

REFEREED JOURNAL PUBLICATIONS

- Fiorino, S.T., Randall, R.M., Bartell, R.J., Downs A.D., Chu, P., and Fan, C.W., "Climate Change: Anticipated Effects on High Energy Laser Weapon Systems in Maritime Environments," early online release, *Journal of Applied Meteorology and Climatology*, September 2010, doi: 10.1175/2010JAMC2482.1. [CDE]
- Fiorino, S.T., Bartell, R.J., Krizo, M.J., Caylor, G.L., Moore, K.P., Harris, T.R., and Cusumano, S.J., "Worldwide uncertainty assessments of ladar and radar signal-to-noise ratio performance for diverse low altitude atmospheric environments," *Journal of Applied Remote Sensing*, Vol. 4, article no. 043533, June 2010. [CDE]
- Fiorino, S.T., Bartell, R.J., Krizo, M.J., McClung, B., Cohen, J.J., Randall, R.M., and Cusumano, S.J., "Broad Spectrum Optical Turbulence Assessments from Climatological Temperature, Pressure, Humidity, and Wind," *Journal of Directed Energy*, Vol. 3, No. 3, pp. 223-238, January 2010. [CDE]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

- Fiorino, S.T., Randall, R.M., Bartell, R.J., Haiducek, J.D., Spencer, M.F., and Cusumano, S.J., "Field Measurements and Comparisons to Simulations of High Energy Laser Propagation and Off-Axis Scatter," *Proceedings of SPIE*, Vol. 7814, article no. 781424, SPIE Optics and Photonics, San Diego, CA, August 2010. [CDE]
- Spencer, M.F., Cusumano, S.J., Schmidt, J.D., and Fiorino, S.T., "Impact of spatial resolution on thermal blooming phase compensation instability," *Proceedings of SPIE*, Vol. 7816, article no. 781608, SPIE Optics and Photonics, San Diego, CA, August 2010. [CDE]
- Fiorino, S.T., Grice, P.M., Krizo, M.J., Bartell, R.J., Haiducek, J.D., and Cusumano, S.J., "Lab Measurements to Support Modeling Terahertz Propagation in Brownout Conditions," *Proceedings of SPIE*, Vol. 7671, article no. 767131, SPIE Defense, Security and Sensing Symposium, Orlando, FL, 5-8 April 2010. [CDE]
- Fiorino, S.T., Haiducek, J.D., Rice, C.A., Downs, A.D., Krizo, M.J., Bartell, R.J., and Cusumano, S.J., "Field and Laboratory Validation of Surface Layer Optical Turbulence and Off-Axis Irradiance," *Proceedings of SPIE*, Vol. 7685, article no. 768513, SPIE Defense, Security and Sensing Symposium, Orlando, FL, 5-8 April 2010. [CDE]
- Leakeas, C.L., Cusumano, S.J., Krizo, M.J., Bartell, R.J., and Fiorino, S.T., "Effects of Thermal Blooming on Systems Comprised of Tiled Subapertures," *Proceedings of SPIE*, Vol. 7696B, article no. 7696B40, SPIE Defense, Security and Sensing Symposium, Orlando, FL, 5-8 April 2010. [CDE]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

- President, Wright Memorial Chapter of the American Meteorological Society. [CDE]
- Fiorino, S.T., Randall, R.M., Ranney, D.P., Bartell, R.J., Krizo, M.J., Cusumano, S.J., and Magee, E.P., "Band Model and Surface Observation Input Updates to the LEEDR Atmospheric Characterization Package," 32nd Review of Atmospheric Transmission Models Meeting, Lexington, MA, 14 June 2010. [CDE]
- Magee, E.P., Fiorino, S.T., Randall, R.M., Ranney, D.P., Bartell, R.J., Krizo, M.J., and Cusumano, S.J., "Models for Laser Propagation using Customized LEEDR Atmospheric Characterization," 32nd Review of Atmospheric Transmission Models Meeting, Lexington, MA, 14 June 2010. [CDE]
- Fiorino, S.T., Randall, R.M., Echeverria, F., Bartell, R.J., Krizo, M.J., and Cusumano, S.J., "High Energy Laser Tactical Decision Aid (HELTDA) for Predictive Avoidance," 5th DEPS Systems Symposium, Monterey, CA, 12-16 April 2010. [CDE]
- Fiorino, S.T., Downs, A.D., Bartell, R.J., Krizo, M.J., and Cusumano, S.J., "Three-Dimensional Optical Turbulence Assessments from Doppler Weather Radar for Laser Applications," 5th DEPS Systems Symposium, Monterey, CA, 12-16 April 2010. [CDE]

Bowers, J., Fiorino, S.T., Cusumano, S.J., and Lofthouse, A., “Numerical Investigation of Statistical Turbulence Effects on Beam Propagation through 2-D Laminar Shear Layer,” 5th DEPS Systems Symposium, Monterey, CA, 12-16 April 2010. [CDE]

Leakeas, C.L., Cusumano, S.J., Krizo, M.J., Bartell, R.J., and Fiorino, S.T., “Enhanced Performance Model of Laser Weapon Systems Comprised of Multiple Tiled Subapertures; Turbulence and Thermal Blooming Effects,” 5th DEPS Systems Symposium, Monterey, CA, 12-16 April 2010. [CDE]

Cusumano, S.J., Velten, V., Bartell, R.J., Krizo, M.J., and Fiorino, S.T., “Track Algorithm Performance against Tactical Targets in Clutter,” 5th DEPS Systems Symposium, Monterey, CA, 12-16 April 2010. [CDE]

Fiorino, S.T., Randall, R.M., Bartell, R.J., Downs, A., Chu, P., and Fan, C.W., “Climate Change: Anticipated Effects on HEL Weapon Systems in Maritime Environments,” Directed Energy Professional Society 12th Annual DE Symposium, San Antonio, TX, 2-6 November 2009. [CDE]

McCue, J., Cusumano, S.J., Krizo, M.J., Bartell, R.J., and Fiorino, S.T., “Performance Model of Laser Weapon Systems Comprised of Multiple Tiled Subapertures,” Directed Energy Professional Society 12th Annual DE Symposium, San Antonio, TX, 2-6 November 2009. [CDE]

Fiorino, S.T., Bartell, R.J., Krizo, M.J., Haiducek, J., Rice, C., Grice, P., Downs, A., and Cusumano, S.J., “Field and Laboratory Validation of Surface Layer Optical Turbulence, Off-Axis Irradiance, and Desert Sand Optical Properties Models,” Directed Energy Professional Society 12th Annual DE Symposium, San Antonio, TX, 2-6 November 2009. [CDE]

Fiorino, S.T., Atmospheric Effects on Military Systems, presentation to Ohio State Geography students at The Ohio State University, 9 October 2009. [CDE]

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 refereed journals. Before 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, CdWO₄) for improved detection of nuclear radiation, wide band-gap semiconductors, and infrared non-linear optical materials for infrared countermeasures. Member of the 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

REFEREED JOURNAL PUBLICATIONS

Hong, Mei, Fredrick, Daniela, DeVito, David M., Howe, Jany Y., Yang, Xiaocheng, Giles, Nancy C., Neal, John S., and Munir, Zuhair A., “Characterization of Green-Emitting Translucent Zinc Oxide Ceramics Prepared Via Spark Plasma Sintering,” *International Journal of Applied Ceramic Technology*, 2010.

Giles, N.C., Halliburton, L.E., Yang, Shan, Yang, Xiaocheng, Brant, A.T., Fernelius, N.C., Schunemann, P.G., and Zawilski, K.T., “Optical and EPR study of point defects in CdSiP₂ crystals,” *Journal of Crystal Growth*, Vol. 312, pp. 1133-1137, 2010.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Brant, Adam T., Yang, Shan, Evans, Sean M., Halliburton, Larry E., and Giles, Nancy C., “Hyperfine interactions in the EPR spectra of neutral nitrogen acceptors in ZnO,” poster presentation at the Fall 2009 Materials Research Society Meeting, Boston, MA, Symp. H: ZnO and Related Materials (H10.46), 30 November – 4 December 2009.

Neal, John S., DeVito, David M., Henry, Jr., John J., Armstrong, Beth L., Yang, Xiaocheng, Giles, Nancy C., Howe, Jane Y., and Boatner, L.A., "Investigation of Spark Plasma Sintering Techniques for Fabricating ZnO-based Polycrystalline Ceramic Scintillators," poster presentation at the IEEE Nuclear Sciences Symposium, Orlando, FL, 25-31 October 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 battlespace (detonation fireballs, muzzle flashes, rocket and 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 five MS students, co-advised three PhD students, and received several research grants during his first three years on the AFIT faculty. Tel: 937-255-3636 x4558 (DSN 785-3636 x4558), email: Kevin.Gross@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

"OPIR Ground Truth Support." Sponsor: NASIC. Funding: \$475,000. [CMSR]

REFEREED JOURNAL PUBLICATIONS

Bradley, Kenneth C., Gross, Kevin C., and Perram, Glen P., "Imaging Fourier Transform Spectrometry of Combustion Events," *IEEE Sensors*, Vol. 10, No. 3, pp. 779-785, March 2010. [CMSR]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Walford, Graham V., Bogard, James S., Gunning, John E., Krichinsky, Alan M., Lewis, Linda A., Smith, Steven E., Gross, Kevin C., Borel, Christoph C., Perram, Glen P., Farley, Vincent, Villemare, Andre, Lux, Gary D., and Patterson, John E., "Enhancing Nuclear Non Proliferation Monitoring by Overlaying Nuclear, Infrared Hyper Spectral FTIR Imaging and Optical Imaging/Scanning Detection Technologies," Proceedings of INMM 51st Annual Meeting, 11-15 July 2010. [CMSR]

Gross, Kevin C., Borel, Chris, White, Allen, Sakai, Stephen, DeVasher, Rebecca, and Perram, Glen P., "First imaging Fourier-transform spectral measurements of detonation in an internal combustion engine," *Proceedings of SPIE*, Vol. 7812, pp. 78120J, 2010.

Gross, Kevin C., Tremblay, Pierre, Bradley, Kenneth C., Chamberland, Martin, Farley, Vincent, and Perram, Glen P., "Instrument calibration and lineshape modeling for ultraspectral imagery measurements of industrial smokestack emissions," *Proceedings of SPIE*, Vol. 7695, pp. 769516, 2010. [CDE, CMSR]

Gross, Kevin C., Young, Anthony M., Borel, Christoph, Steward, Bryan J., and Perram, Glen P., "Simulating systematic scene-change artifacts in Fourier-transform spectroscopy," *Proceedings of SPIE*, Vol. 7695, pp. 76951Y, 2010. [CMSR]

Gordon, Joe Motos, Gross, Kevin C., Spidell, Matthew T., Pitz, Jeremy J., and Perram, Glen P., "High speed spectral measurements of IED detonation fireballs," *Proceedings of SPIE*, Vol. 7665, pp. 76650S, 2010. [CMSR]

Spidell, Matthew T., Gordon, Joe Motos, Pitz, Jeremy, Gross, Kevin C., and Perram, Glen P., "High speed radiometric measurements of IED detonation fireballs," *Proceedings of SPIE*, Vol. 7668, pp. 76680C, 2010. [CMSR]

Macdonald, Douglas J., Hawks, Michael R., and Gross, Kevin C., "Passive ranging using mid-wavelength infrared atmospheric attenuation," *Proceedings of SPIE*, Vol. 7660, pp. 766041, 2010. [CDE]

Gross, Kevin C., Perram, Glen P., and Tremblay, Pierre, "Jet Engine Exhaust Plume Characterization via Imaging Fourier Transform Spectroscopy," 31st Exhaust Plume and Signatures JANNAF Subcommittee Meeting, October 2009. [CMSR]

Moore, Elizabeth A., Gross, Kevin C., Bowen, Spencer J., Perram, Glen P., Chamberland, Martin, Farley, Vincent, Gagnon, Jean-Philippe, Lagueux, Philippe, and Villemaire, Andre, "Characterizing an overcoming spectral artifacts in Imaging Fourier Transform Spectroscopy of turbulent exhaust plumes," NATO Report, RTO-MP-SET-151. [CDE, CMSR]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Walford, Graham V., Bogard, James S., Gunning, John E., Krichinsky, Alan M., Lewis, Linda A., Smith, Steven E., Gross, Kevin C., Borel, Christoph C., Perram, Glen P., Farley, Vincent, Villemaire, Andre, Lux, Gary D., and Patterson, John E., "Enhancing Nuclear Non Proliferation Monitoring by Overlaying Nuclear, Infrared Hyper Spectral FTIR Imaging and Optical Imaging/Scanning Detection Technologies," INMM 51st Annual Meeting, 11-15 July 2010. [CMSR]

Key member of the Remote Sensing Group Team, which won the Air Force-wide ST&E Team Award for Exploratory or Advanced Technology Development, July 2010. [CDE, CMSR]

"Investigation of a Turbulent Jet Engine with the Telops Hyper-CAM IFTS," presented at the 4th Telops Scientific Workshop, Baltimore, MD, May 2010 (invited speaker). [CDE, CMSR]

"Investigation of Smokestack Plumes with the Telops Hyper-CAM IFTS," presented at the 4th Telops Scientific Workshop, Baltimore, MD, May 2010 (invited speaker). [CDE, CMSR]

Pitz, Jeremy, Gross, Kevin C., and Perram, Glen P., "Statistical analysis of image Fourier Transform Spectroscopy as an operational plume combustion diagnostic tool," 35th Dayton-Cincinnati Aerospace Sciences Symposium, 9 March 2010.

HAGER, GORDON,

Research Professor of Chemical Physics, Department of Engineering Physics, AFIT Appointment Date: 2007 (AFIT/ENP); BS, Western Washington University, 1968; PhD, Washington State University, 1973. Professor Hager's research primarily 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 eight MS students, eight PhD students, and eight postdoctoral researchers. He has published over 50 refereed articles and led the team to demonstrate the first supersonic Chemical Oxygen-Iodine Laser, now the weapon aboard the Airborne Laser.

REFEREED JOURNAL PUBLICATIONS

Zameroski, Nathan D., Rudolph, Wolfgang, Hager Gordon D., and Hostutler, David A., "A study of collisional quenching and radiation-trapping kinetics for Rb(5p) in the presence of methane and ethane using time-resolved fluorescence," *Journal of Physics B: Atomic, Molecular and Optical Physics*, Vol. 42, article no. 245401, 10 pages, 4 December 2009.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Hager, Gordon D., and Perram, Glen P., "A three level analytic model for alkali vapor lasers," paper published in Proceedings of High Power Laser Ablation Conference, Santa Fe, NM, April 2010. [CDE]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Hager, Gordon D., and Perram, Glen P., "Extended Saturation Analysis and Analytic Model of Diode Pumped Alkali Lasers," SPIE LASE: Laser Applications in Science and Engineering, San Francisco, CA, January 2010, *Proceedings of SPIE*, Vol. 7581, article no. 75810J, 17 February 2010. [CDE]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Rotondaro, Matthew D., Wisniewski, Charles F., Post, Martiqua L., and Hager, Gordon D., "Measurement of Rubidium Number Density under Optically Thick Conditions," 41st Plasmadynamics and Lasers Conference, Chicago, IL, 28 June – 1 July 2010, AIAA 2010-4881.

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 United States Air Force Academy and has conducted research in chemical lasers, space object identification, chem/bio agent detection, infrared countermeasures, nuclear detonation detection, and other remote sensing applications at the Air Force Research Laboratory and other assignments. He has 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

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Macdonald, Douglas J., Hawks, Michael R., and Gross, Kevin C., "Passive ranging using mid-wavelength infrared atmospheric attenuation," *Proceedings of SPIE*, Vol. 7660, pp. 766041, 2010. [CMSR]

O'Dell, Daniel C., Bostick, Randy, Hawks, Michael R., Swenson, Eric D., Black, Jonathan T., Cobb, Richard G., and Perram, Glen P., "Chromotomographic imager field demonstration results," *Proceedings of SPIE*, Vol. 7668, pp. 766804, April 2010.

HENGHELD, 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 Hengehold'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 Sensors Directorates at AFRL and DTRA. He received the Air University Commander's Award for Faculty Achievement in 1982, the Gage H. Crocker Outstanding Professor Award in 1996, the Outstanding Professional Achievement Award from the Affiliate Society Council of the Engineering and Science Foundation of Dayton in 1997, and the General Bernard A. Schriever Award in 1999. He was elected a Fellow of the American Physical Society in 2008. Tel. 937-255-3636 x4502 (DSN 785-3636 x4502), email: Robert.Hengehold@afit.edu

REFEREED JOURNAL PUBLICATIONS

Moore, E.A., Yeo, Y.K., Gruen, G.J., Ryu, Mee-Yi, and Hengehold, R.L., "Temperature-Dependent Studies of Si-Implanted $\text{Al}_{0.33}\text{Ga}_{0.67}\text{N}$ with Different Annealing Temperature and Times," *Journal of Electronic Materials*, Vol. 39, pp. 21-28, 2010.

Moore, E.A., Yeo, Y.K., Hengehold, R.L., and Ryu, Mee-Yi, "Activation Studies of Si-Implanted $\text{Al}_{0.45}\text{Ga}_{0.55}\text{N}$ by Using Cathodoluminescence and Temperature-Dependent Hall-Effect Measurements," *Journal of the Korean Physical Society*, Vol. 55, pp. 2465-2469, December 2009.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Serves as Honors and Awards Chair of the Ohio Region Section of the American Physical Society.

Bergstrom, A.C., Wei, J.W., Yeo, Y.K., Guha, S., Rajagopalan, G., Ryu, M.Y., and Hengehold, R.L., "Optical and Electrical Characterization Studies of Bulk $\text{In}_x\text{Ga}_{1-x}\text{As}$ with High Indium Mole Fraction," presented at the 30th International Conference of Physics of Semiconductors, Seoul, Korea, 25-30 July 2010.

Harris, Thomas R., Guha, Shekhar, Yeo, Yung Kee, Gonzalez, Leo, Carpenter, Amelia, and Hengehold, Robert, "Infrared Absorption Measurements of GaAs, GaSb, and InAs at Elevated Temperatures," presented at the Spring 2010 Meeting of the Ohio Section of the American Physical Society, Flint, MI, 30 March – 1 April 2010.

Bergstrom, Austin, Wei, Jean, Yeo, Yung Kee, Guha, Shekhar, Gonzalez, Leo, Hengehold, Robert, Dutta, Partha, and Rajagopalan, Geeta, "Optical and Electrical Characterization of Bulk-Grown Ternary $\text{In}_x\text{Ga}_{1-x}\text{As}$," presented at the March 2010 Meeting of the American Physical Society, Seattle, WA, 15-19 March 2010.

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. He also conducts classified research with space-based nuclear detonation detection sensors in collaboration with the Los Alamos National Laboratory. Tel. 937-255-3636 x4649 (DSN 785-3636 x4649), email: Jeremy.Holtgrave@afit.edu

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Miller, Woody S., Sulham, Clifford V., Holtgrave, Jeremy C., and Perram, Glen P., "Effects of mode matching and radial intensity distributions in pulsed, optically pumped rubidium laser," paper published in Proceedings of the High Power Laser Ablation Conference, Santa Fe, NM, April 2010. [CDE]

JOHN, GEORGE,

Professor Emeritus of Nuclear Engineering, Department of Engineering Physics (AFIT/ENP); BSc, The Ohio State University, 1948; PhD, The 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 include the natural radiation background and health physics.

KOWASH, BENJAMIN R., Maj,

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. Maj Kowash's research interests include the fields of radiation detection and measurements (emphasis on imaging and inverse problems) and nuclear reactor design and analysis. His current research considers autonomous radiation imaging systems and algorithms for the stand-off detection (10-100 meters) of lost or hidden radioactive sources over wide fields of view. His other interests include detector design for active interrogation applications, 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

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Kowash, B.R., Rockrohr, R.L., Burggraf, L.W., Petrosky, J.C., and McClory, J., "Estimating Source Position in Sealed Shipping Canisters Using Gamma Ray Spectra From a Portable HPGe Detector," presented at the 2010 Symposium on Radiation Measurements and Applications, Ann Arbor, MI, 24-28 May 2010.

McClory, J.W., Young, C.M., Kowash, B.R., and Petrosky, J.C., “Solid State Neutron Detection with a Gadolinium Oxide and p-type Silicon Heterojunction,” presented at the 2010 Symposium on Radiation Measurements and Applications, Ann Arbor, MI, 24-28 May 2010.

Boyce, N.O., Kowash, B.R., and Wehe, D.K., “Thermal Neutron Imaging with a Rotationally Modulated Collimator (RMC),” presented at the Fall 2009 Nuclear Science Symposium, Orlando, FL, 25-31 October 2009.

Kowash, B.R., Wehe, D.K., and Boyce, N.O., “Extended Source Imaging Using a Single Rotating Modulation Collimator,” presented at the Fall 2009 Nuclear Science Symposium, Orlando, FL, 25-31 October 2009.

LI, ALEX GUANGMING,

Research Assistant Professor, Department of Engineering Physics, AFIT Appointment Date: 1995 (Research Associate), 2008 (Research Faculty); PhD, Materials Science, 1990, Chinese Academy of Sciences at Shanghai Institute of Optics and Fine Mechanics; MS, Materials Science, 1987, Chinese Academy of Sciences at Shanghai Institute of Optics and Fine Mechanics; BS, Materials Science, 1982, Changchun University of Science and Technology. His current research interests include developing AFM techniques for measuring nanometer-scale thermal and mechanical properties and generating nano-patterns at elevated temperatures for photonic and electro-optic applications. He has invented a novel AFM nano-patterning technique for producing sub-100 nm nanostructures in polymers. He has authored over two dozen archival publications in refereed 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 and 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 (DSN 785-3636 x4576), email: Alex.Li@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

“Electrically Switchable Nano-Ionic Memory Devices.” Sponsor: AFRL/RI. Funding: \$15,000.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Herr, N.C., Marciniak, M.A., Li, A.G., and Burggraf, L.W., “Bidirectional reflectance distribution of a 2D thin-film photonic crystal patterned using an atomic-force microscope,” *Proceedings of SPIE*, Vol. 7792, article no. 77920H, 2010.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Herr, Nicholas, Marciniak, Michael A., Li, Alex G., and Burggraf, Larry W., “Bidirectional reflectance distribution of a 2D thin-film photonic crystal patterned using an atomic-force microscope,” SPIE Optics + Photonics 2010, San Diego, CA, 1-5 August 2010.

Herr, N.C., Marciniak, M.A., Li, A.G., Burggraf, L.W., and Fitzgerald, T.M., “AFM-patterned 2D thin-film polymer photonic crystal analyzed by polarimetric scatterometry,” presented at the International Symposium “Electromagnetic meta-materials” of the Forum on New Materials, part of CIMTEC 2010 – 12th International Ceramics Congress and 5th Forum on New Materials, Montecatini Terme, Tuscany, Italy, 6-18 June 2010.

Li, Alex G., Marciniak, Michael A., and Burggraf, Larry, W., “Nano Processing and Characterizing of Polymers Using Atomic Force Microscopy,” 2010 NanoTechnology for Defense Conference, Atlanta, GA, 3-6 May 2010.

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 conducts and manages research in machine intelligence, near and remote sensing, pattern recognition, network science, and distributed intelligence with particular interest in signal to symbol translations and query based intelligence assessments of sensor management systems. She designs active workspaces for the analysis of kinetic events to ensure authoritative reporting of actionable information. Maj Magnus has published 11 articles and is writing a book on machine intelligence. Tel. 937-255-3636 x4555 (DSN 785-3636 x4555), email: Amy.Magnus@afit.edu

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Presented an invited talk, "On Access and Authority," at a DARPA-sponsored information science and technology study, "What is the data worth?," Philadelphia, PA, 25 February 2010.

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 various aspects of light-matter interaction, including (1) polarimetric scatterometry of nanostructured materials, such as photonic crystals, plasmonic materials, and optical meta-materials; (2) bidirectional reflectance distributions for optical signatures; and (3) high-energy laser damage assessment. He has published 15 refereed and 37 other publications and chaired 2 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

SPONSOR FUNDED RESEARCH PROJECTS

"BRDF Measurement Research." Sponsor: AFRL/RY. Funding: \$135,000.

"Infrared Counter-Countermeasure Research." Sponsor: AFRL/RX. Funding: \$25,000. [CDE]

"RF/Optical/Thermal Metamaterials Research." Sponsor: AFRL/RX. Funding: \$106,603.

REFEREED JOURNAL PUBLICATIONS

Cole, W.P., and Marciniak, M.A., "Path-averaged Cn₂ estimation using a laser-and-corner-cube system," *Applied Optics*, Vol. 48, article no. 4256, 2009. [CDE]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Langley, D., Coutu, Jr., R.A., Starman, L.A., and Marciniak, M.A., "Investigation into metamaterial structures operating at terahertz wavelength," *Proceedings of SPIE*, Vol. 7592, article no. 75920X, 2010.

Fitzgerald, T.M., and Marciniak, M.A., "Full-Mueller scatter characterization of novel optical and infrared meta-materials," *Proceedings of the 13th International Congress and Exposition on Experimental and Applied Mechanics 2010*, Curran Associates, Inc., 2010. [CDE]

Fitzgerald, T.M., and Marciniak, M.A., "Full optical scatter analysis for novel photonic and infrared meta-materials," *Advances in Science and Technology*, Vol. 75, pp. 240, 2010. [CDE]

Fitzgerald, T.M., Marciniak, M.A., and Nauyoks, S.E., "Development of a tunable polarimetric scatterometry system in the MWIR and LWIR," *Proceedings of SPIE*, Vol. 7792, article no. 779209, 2010. [CDE]

Herr, N.C., Marciniak, M.A., Li, A.G., and Burggraf, L.W., “Bidirectional reflectance distribution of a 2D thin-film photonic crystal patterned using an atomic-force microscope,” *Proceedings of SPIE*, Vol. 7792, article no. 77920H, 2010.

Hoelscher, M.G., and Marciniak, M.A., “Restoration of scene information reflected from a non-specular surface,” *Proceedings of SPIE*, Vol. 7792, article no. 77920L, 2010. [CDE]

Balling, B.L., and Marciniak, M.A., “Comparative BRDF study of several surfaces as potential MWIR diffuse reflectance standards,” *Proceedings of SPIE*, Vol. 7453, article no. 74530O-1, 2009. [CDE]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Herr, Nicholas, Marciniak, Michael A., Li, Alex G., and Burggraf, Larry W., “Bidirectional reflectance distribution of a 2D thin-film photonic crystal patterned using an atomic-force microscope,” SPIE Optics + Photonics 2010, San Diego, CA, 1-5 August 2010.

Herr, N.C., Marciniak, M.A., Li, A.G., Burggraf, L.W., and Fitzgerald, T.M., “AFM-patterned 2D thin-film polymer photonic crystal analyzed by polarimetric scatterometry,” presented at the International Symposium “Electromagnetic meta-materials” of the Forum on New Materials, part of CIMTEC 2010 – 12th International Ceramics Congress and 5th Forum on New Materials, Montecatini Terme, Tuscany, Italy, 6-18 June 2010.

Li, Alex G., Marciniak, Michael A., and Burggraf, Larry, W., “Nano Processing and Characterizing of Polymers Using Atomic Force Microscopy,” 2010 NanoTechnology for Defense Conference, Atlanta, GA, 3-6 May 2010.

Marciniak, M.A., “Polarimetric scatterometry at AFIT,” presented at the 2010 Polarimetry for SSA Roundtable, Kirtland AFB, NM, 9-10 February 2010. [CDE]

Marciniak, M.A., “Polarimetric scatterometry: A novel optical meta-material characterization technique,” presented at the 2009 AFRL 6.2 Meta-materials Workshop, Wright-Patterson AFB, OH, 6-8 October 2009.

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 20 papers in refereed journals and 21 conference proceedings and chaired 35 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

SPONSOR FUNDED RESEARCH PROJECTS

“AFIT Research Supporting Satellite-Based Nuclear Detonation Detection.” Sponsor: DOE NNSA. Funding: \$35,000.

REFEREED JOURNAL PUBLICATIONS

Mathews, Kirk, Dishaw, James, Wager, Nicholas, and Prins, Nicholas, “Adaptive Partial-Current Discrete Ordinates Radiation Transport with Distribution Iteration: An Alternative to Source Iteration,” *Nuclear Science and Engineering*, Vol. 163, No. 13, pp. 191-214, November 2009.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Mathews, Kirk, “Gaussian Catastrophes: Empirical Distributions, Confidence Limits, and the Limits of Knowledge of the Probability of Unlikely Events,” USNDS Review and AFTAC Satellite Sensor Review, Patrick AFB, FL, 10-12 May 2010.

McCLORY, JOHN W., LTC,

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. LTC McClory’s expertise is in radiation effects on electronic devices, semiconductor device characterization, radiation detector development, and nuclear weapon effects. His 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 five MS and two PhD students. LTC McClory is a liaison officer from the Defense Threat Reduction Agency and the Senior United States Army representative at AFIT. Tel. 937-255-3636 x7308 (DSN 785-3636 x7308), email: John.McClory@afit.edu.

SPONSOR FUNDED RESEARCH PROJECTS

“DTRA-AFIT Nuclear Partnership.” Sponsor: DTRA. Funding: \$60,000.

“Radiation Effects on Rare Earth Oxide High-k Dielectrics.” Sponsor: AFOSR. Funding: \$26,445.

SPONSOR FUNDED EDUCATIONAL PROJECTS

“DTRA-AFIT Nuclear Partnership.” Sponsor: DTRA. Funding: \$40,000.

REFEREED JOURNAL PUBLICATIONS

Adamiv, Volodymyr T., Burak, Yaroslav V., Wooten, David J., McClory, John, Petrosky, James, Ketsman, Ihor, Xiao, Jie, Losovyj, Yaroslav B., and Dowben, Peter A., “The Electronic Structure and Secondary Pyroelectric Properties of Lithium Tetraborate,” *Materials*, Vol. 3, Issue 9, pp. 4550-4579, September 2010.

Schemm, N., Balkir, S., Hoffman, M., Bauer, M., Schultz, D., Petrosky, J., McClory, J., Natta, M., Brand, J., Tang, J., and Wang, W., “A Single Chip Computational Sensor System for Neutron Detection Applications,” *IEEE Sensors Journal*, Vol. 10, No. 7, pp. 1226-1233, July 2010.

Swinney, M.W., McClory, J.W., Petrosky, J.C., Yang, Shan, Brant, A.T., Adamiv, V.T., Burak, Ya. V., Dowben, P.A., and Halliburton, L.E., “Identification of electron and hole traps in lithium tetraborate ($\text{Li}_2\text{B}_4\text{O}_7$) crystals: Oxygen vacancies and lithium vacancies,” *Journal of Applied Physics*, Vol. 107, Issue 11, article no. 113715, June 2010.

McGary, J., Petrosky, J., McClory, J., Mall, S., Farlow, G., and Hansen, N., “Electrostatic Discharge Properties of Irradiated Nanocomposites,” *Journal of Radiation Effects, Research and Engineering*, Vol. 28, No. 1, pp. 79-84, February 2010.

Arnold, D.M., Lam, E., McClory, J., Petrosky, J.C., and Kim, Y.C., “Stability of Gamma Irradiated Synchronous Dynamic Random Access Memory (SDRAM),” *Journal of Radiation Effects, Research and Engineering*, Vol. 28, No. 1, pp. 1-5, February 2010.

Schultz, David, Blasy, Bryan, Santana, Juan Colon, Petrosky, J.C., McClory, J.W., LaGrafte, D. Brand, J.I., Tang, Jinke, Wang, Wendong, Schemm, N., Balkir, S., Bauer, M., Ketsman, I., Fairchild, R.W., Losovyj, Ya. B., and Dowben, P.A., "The K-shell Auger Electron Spectrum of Gadolinium Obtained Using Neutron Capture in a Solid State Device," *Journal of Physics D*, Vol. 43, Issue 7, article no. 075502, 5 February 2010.

Ketsman, I., Wooten, D., Xiao, J., Losovyj, Ya. B., Burak, Ya. V., Adamiv, V.T., Sokolov, A., Petrosky, J., McClory, J., and Dowben, P.A., "The off-axis pyroelectric effect observed for lithium tetraborate," *Physics Letters A*, Vol. 374, pp. 891-895, 6 January 2010.

Wooten, D., Ketsman, I., Xiao, Jie, Losovyj, Ya. B., Petrosky, J., McClory, J., Burak, Ya. V., Adamiv, V.T., and Dowben, P.A., "The Surface Core Level Shift for Lithium at the Surface of Lithium Borate," *Physica B: Condensed Matter*, Vol. 405, Issue 1, pp. 461-464, 1 January 2010.

Moran, J., McClory, J., Petrosky, J., and Farlow, G., "The Effects of Temperature and Electron Radiation on the Electrical Properties of AlGaIn/GaN HFETs," *IEEE Transactions on Nuclear Science*, Vol. 56, No. 6, pp. 3223-3228, December 2009.

Petrosky, J., McClory, J., Gray, T., and Uhlman, T., "Trap-Assisted Tunneling Induced Currents in Neutron Irradiated AlGaIn/GaN HFETs," *IEEE Transactions on Nuclear Science*, Vol. 56, No. 5, pp. 2905-2909, October 2009.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Estep, N.A., Petrosky, J., McClory, J., Kim, Y., and Terzuoli, A. "Electromagnetic Interference (EMI) and Ionizing Radiation Effects on CMOS Devices," presented at the IEEE Nuclear and Space Radiation Effects Conference, Denver, CO, 20-23 July 2010.

Kowash, B.R., Rockrohr, R.L., Burggraf, L.W., Petrosky, J.C., and McClory, J., "Estimating Source Position in Sealed Shipping Canisters Using Gamma Ray Spectra From a Portable HPGe Detector," presented at the 2010 Symposium on Radiation Measurements and Applications, Ann Arbor, MI, 24-28 May 2010.

McClory, J.W., Young, C.M., Kowash, B.R., and Petrosky, J.C., "Solid State Neutron Detection with a Gadolinium Oxide and p-type Silicon Heterojunction," presented at the 2010 Symposium on Radiation Measurements and Applications, Ann Arbor, MI, 24-28 May 2010.

Young, C.M., Mikina, J.K., McClory, J.W., and Petrosky, J.C., "Gate Bias Dependent Neutron Radiation Effects on AlGaIn/GaN Heterojunction Field Effect Transistors," presented at the Hardened Electronics and Radiation Technology Conference, Tucson, AZ, 20-23 April 2010.

Estep, N.A., McHale, S.R., McClory, J.W., and Petrosky, J.C., "Ionizing Radiation Effects on CMOS HEX Inverter Performance," presented at the Hardened Electronics and Radiation Technology Conference, Tucson, AZ, 20-23 April 2010.

McHale, S.R., Wooten, D.J., McClory, J.W., Petrosky, J.C., and Losovyj, Ya. B., "Photoemission study of Au-Schottky barrier formation on YbGaN thin films using synchrotron radiation," presented at the Materials Research Society Spring Meeting, San Francisco, CA, 5-9 April 2010.

McHale, S.R., Wooten, D.J., McClory, J.W., and Petrosky, J.C., "Photoemission study of Au-Schottky barrier formation on AlGaN using synchrotron radiation," presented at the American Vacuum Society Annual Symposium, San Jose, CA, 9-13 November 2009.

McClory, John, Petrosky, James, and Moran, Jeffrey, "The Effect of Silicon Nitride Passivation on the Electrical Properties of Neutron and Electron Radiated AlGaIn/GaN HFETs," presented at the IEEE Nuclear Science Symposium, Orlando, FL, 25-31 October 2009.

McClory, J., Blasy, B., Schultz, D., Petrosky, J., Tang, J., Wang, Z., Brand, J., and Dowben, P., “Neutron Detection Using Gd-doped HfO₂/Silicon Heterojunctions,” presented at the 2009 IEEE Nuclear Science Symposium, Orlando, FL, 25-31 October 2009.

McClory, John, and Sheely, Eugene, “AFIT Graduate Nuclear Engineering and Combating WMD Programs,” presented at the DTRA Detailee Training Conference, Fort Belvoir, VA, 14-16 October 2009.

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 39 MS students, received 39 research grants, and published over 50 journal articles during his 20 years on the AFIT faculty. Tel. 937-255-3636 x4504 (DSN 785-3636 x4504), email: Glen.Perram@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

“High Power Diode Pumped Alkali Vapor Lasers and Analog Systems.” Sponsor: AFRL/RD. Funding: \$352,450. [CDE]

“Hollow Core Fiber Alkali Lasers.” Sponsor: AFRL/RD. Funding: \$27,000. [CDE]

“Technical Support for the Center of Excellence for High Energy Lasers.” Sponsor: AFRL/RD. Funding: \$41,000. [CDE]

“Thermal Control of Diode Pumped Alkali Lasers Using Heat Pipes.” Sponsor: HELJTO. Funding: \$20,000. [CDE]

REFEREED JOURNAL PUBLICATIONS

Bradley, Kenneth C., Gross, Kevin C., and Perram, Glen P., “Imaging Fourier Transform Spectrometry of Combustion Events,” *IEEE Sensors*, Vol. 10, No. 3, pp. 779-785, March 2010. [CMSR]

Anderson, Monte D., and Perram, Glen P., “Frequency tuning of the optical delay in cesium D2 line including hyperfine structure,” *Physical Review A*, 81, 033842, 1-4 March 2010. [CDE]

Kee, Patrick D., and Perram, Glen P., “Electronic state distributions of YBa₂Cu₃O_{7-x} laser ablated plumes,” *Applied Spectroscopy*, Vol. 64, pp. 742, 2010.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Lange, Matthew A., Pitz, Greg A., and Perram, Glen P., “The effect of residence time on the production of singlet oxygen in microwave and RF discharges,” High Power Laser Ablation Conference, Santa Fe, NM, April 2010. [CDE]

Miller, Woody S., Sulham, Clifford V., Holtgrave, Jeremy C., and Perram, Glen P., “Effects of mode matching and radial intensity distributions in pulsed, optically pumped rubidium laser,” High Power Laser Ablation Conference, Santa Fe, NM, April 2010. [CDE]

Hager, Gordon D., and Perram, Glen P., “A three level analytic model for alkali vapor lasers,” High Power Laser Ablation Conference, Santa Fe, NM, April 2010. [CDE]

Guild, Eric M., Anderson, Monte D., and Perram, Glen P., “Frequency dependent optical delay with gain in the Cesium diode pumped alkali laser system,” High Power Laser Ablation Conference, Santa Fe, NM, April 2010. [CDE]

Bostick, Randall L., and Perram, Glen P., "Instrumental Systematic Errors in a Chromotomographic Hyperspectral Imaging System," IEEE Aerospace Conference, Big Sky, MT, March 2010, Proceedings of the 2010 IEEE Aerospace Conference, 5.0703. [CMSR]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Gross, Kevin C., Borel, Chris, White, Allen, Sakai, Stephen, DeVasher, Rebecca, and Perram, Glen P., "First imaging Fourier-transform spectral measurements of detonation in an internal combustion engine," *Proceedings of SPIE*, Vol. 7812, pp. 78120J, 2010. [CMSR]

Walford, Graham V., Bogard, James S., Gunning, John E., Krichinsky, Alan M., Lewis, Linda A., Smith, Steven E., Gross, Kevin C., Borel, Christoph C., Perram, Glen P., Farley, Vincent, Villemaire, Andre, Lux, Gary D., and Patterson, John E., "Enhancing Nuclear Non Proliferation Monitoring by Overlaying Nuclear, Infrared Hyper Spectral FTIR Imaging and Optical Imaging/Scanning Detection Technologies," INMM 51st Annual Meeting, 11-15 July 2010. [CMSR]

Thornton, Douglas, and Perram, Glen P., "Rates for Velocity Changing Collisions in Optically Pumped Rubidium Laser," 41st AIAA Plasmasdynamics and Lasers Conference, Chicago, IL, 28 June 2010, AIAA-2010-4880. [CDE]

Sulham, Clifford V., and Perram, Glen P., "Temporal Dynamics of an Optically Pumped Alkali Laser at High Pump Intensity," 41st AIAA Plasmasdynamics and Lasers Conference, Chicago, IL, 28 June 2010, AIAA-2010-4879. [CDE]

Pitz, Greg A., Sulham, Clifford V., and Perram, Glen P., "Alkali Lasers Operating in the Infrared and Blue Pumped by Two Red Photon Absorption," 41st AIAA Plasmasdynamics and Lasers Conference, Chicago, IL, 28 June 2010, AIAA-2010-4876. [CDE]

Gross, Kevin C., Young, Anthony, Borel, Christoph, Steward, Bryan, and Perram, Glen P., "Simulating systematic scene-change artifacts in Fourier-transform spectroscopy," SPIE Defense and Security Symposium, Orlando, FL, April 2010, *Proceedings of SPIE*, Vol. 7695, pp. 76951Y, 13 May 2010. [CMSR]

Gross, Kevin C., Tremblay, Pierre, Bradley, Kenneth C., Chamberland, Martin, Farley, Vincent, and Perram, Glen P., "Instrument calibration and lineshape modeling for ultraspectral imagery measurements of industrial smokestack emissions," SPIE Defense and Security Symposium, 7695-42, Orlando, FL, April 2010, *Proceedings of SPIE*, Vol. 7695, pp. 769516, 12 May 2010. [CMSR]

Gordon, Joe Motos, Gross, Kevin C., Spidell, Matthew T., Pitz, Jeremy J., and Perram, Glen P., "High speed spectral measurements of IED detonation fireballs," SPIE Defense and Security Symposium, 7665-27, Orlando, FL, April 2010, *Proceedings of SPIE*, Vol. 7665, pp. 76650S, 5 May 2010. [CMSR]

Spidell, Matthew T., Gordon, Joe Motos, Pitz, Jeremy, Gross, Kevin C., and Perram, Glen P., "High speed radiometric measurements of IED detonation fireballs," SPIE Defense and Security Symposium, 7668-12, Orlando, FL, April 2010, *Proceedings of SPIE*, Vol. 7668, pp. 76680C, 26 April 2010. [CMSR]

O'Dell, Daniel C., Bostick, Randy, Hawks, Michael R., Swenson, Eric D., Black, Jonathan T., Cobb, Richard G., and Perram, Glen P., "Chromotomographic imager field demonstration results," SPIE Defense and Security Symposium, Orlando, FL, April 2010, *Proceedings of SPIE*, Vol. 7668, pp. 766804, 24 April 2010. [CMSR]

Hager, Gordon D., and Perram, Glen P., "Extended Saturation Analysis and Analytic model of Diode Pumped Alkali Lasers," SPIE LASE: Laser Applications in Science and Engineering, San Francisco, CA, January 2010, *Proceedings of SPIE*, Vol. 7581, pp. 75810J, 17 February 2010. [CDE]

Anderson, Monte, and Perram, Glen P., "Slow Light in Cesium vapor: Pulse Delay Measurements and Predicted Delay," SPIE LASE: Laser Applications in Science and Engineering, San Francisco, CA, January 2010, *Proceedings of SPIE*, Vol. 7612, pp. 76120A, 8 February 2010. [CDE]

Gross, Kevin C., Perram, Glen P., and Tremblay, Pierre, "Jet Engine Exhaust Plume Characterization via Imaging Fourier Transform Spectroscopy," 31st Exhaust Plume and Signatures JANNAF Subcommittee Meeting, October 2009. [CMSR]

Moore, Elizabeth A., Gross, Kevin C., Bowen, Spencer J., Perram, Glen P., Chamberland, Martin, Farley, Vincent, Gagnon, Jean-Philippe, Lagueux, Philippe, and Villemaire, Andre, "Characterizing an overcoming spectral artifacts in Imaging Fourier Transform Spectroscopy of turbulent exhaust plumes," NATO Report, RTO-MP-SET-151. [CMSR]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Fox, Charles D., Wertpeny, Douglas E., Pitz, Greg A., and Perram, Glen P., "Lineshapes for optically pumped cesium lasers," 2010 IEEE National Aerospace and Electronics Conference, Dayton, OH, July 2010. [CDE]

Acosta, Ericka A., Jones, Paul, Sulham, Clifford, and Perram, Glen P., "Energy Pooling Kinetics in Diode Pumped Alkali Lasers," 2010 IEEE National Aerospace and Electronics Conference, Dayton, OH, July 2010. [CDE]

Perram, Glen, Sulham, Clifford, and Pitz, Greg, "Blue and IR alkali lasers pumped by multi-photon absorption," SPIE Newsroom, February 2010. [CDE]

Pitz, Jeremy, Gross, Kevin C., and Perram, Glen P., "Statistical analysis of image Fourier Transform Spectroscopy as an operational plume combustion diagnostic tool," 35th Dayton-Cincinnati Aerospace Sciences Symposium, 9 March 2010. [CMSR]

Thornton, Douglas E., Phillips, Grady T., and Perram, Glen P., "Inter-modulated, sub-Doppler Saturation Spectroscopy of the $F''=2$ Hyperfine Component of the 87Rb D2 Line," 12th Annual Directed Energy Symposium, San Antonio, TX, 2-6 November 2009. [CDE]

Sulham, Clifford V., Perram, Glen P., Hostutler, David A., and Wilkenson, Michael P., "Pulsed, Optically-Pumped Rubidium Laser Scaled to 24 x Threshold," 12th Annual Directed Energy Symposium, San Antonio, TX, 2-6 November 2009. [CDE]

Pitz, Greg A., Jones, Paul, and Perram, Glen P., "Diode Pumped Alkali Laser Kinetics: Energy Pooling and Second Order Processes," 12th Annual Directed Energy Symposium, San Antonio, TX, 2-6 November 2009. [CDE]

Anderson, Monte D., and Perram, Glen P., "Slow Light Delay Predictions and Measurements in Hot Cesium Vapor," Frontiers in Optics and Laser Science, San Jose, CA, 11-15 October 2009. [CDE]

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. His research spans narrow and wide band gap materials using combinations of electrical, optical, and absorption spectroscopy to gain information on the damaging effects of ionizing and non-ionizing radiation. Experimental techniques include I-V(T), C-V(T), photoluminescence spectroscopy, Hall Effect, 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

SPONSOR FUNDED RESEARCH PROJECTS

“Addendum: Support to NNSA for QASPR Review.” Sponsor: DOD NNSA. Funding: \$150,000.

“Support Activities to the Department of Homeland Security.” Sponsor: DHS/DNDO. Funding: \$150,000.

SPONSOR FUNDED EDUCATIONAL PROJECTS

“AFRL GNE Student Support.” Sponsor: AFRL/RD. Funding: \$15,392.

REFEREED JOURNAL PUBLICATIONS

Adamiv, Volodymyr T., Burak, Yaroslav V., Wooten, David J., McClory, John, Petrosky, James, Ketsman, Ihor, Xiao, Jie, Losovyj, Yaroslav B., and Dowben, Peter A., “The Electronic Structure and Secondary Pyroelectric Properties of Lithium Tetraborate,” *Materials*, Vol. 3, Issue 9, pp. 4550-4579, September 2010.

Schemm, N., Balkir, S., Hoffman, M., Bauer, M., Schultz, D., Petrosky, J., McClory, J., Natta, M., Brand, J., Tang, J., and Wang, W., “A Single Chip Computational Sensor System for Neutron Detection Applications,” *IEEE Sensors Journal*, Vol. 10, No. 7, pp. 1226-1233, July 2010.

Mall, S., Petrosky, J., Harder, B., Alexander, M., Hansen, G., and Hansen, N., “Investigation in Nickel Nanostrands™ Based Nanocomposites for Space Applications,” *Journal of Radiation Effects, Research and Engineering*, Vol. 28-1, July 2010.

McGary, J., Petrosky, J., McClory, J., Mall, S., Farlow, G., and Hansen, N., “Electrostatic Discharge Properties of Irradiated Nanocomposites,” *Journal of Radiation Effects, Research and Engineering*, Vol. 28, No. 1, pp. 79-84, July 2010.

Arnold, D.M., Lam, E., McClory, J., Petrosky, J.C., and Kim, Y.C., “Stability of Gamma Irradiated Synchronous Dynamic Random Access Memory (SDRAM),” *Journal of Radiation Effects, Research and Engineering*, Vol. 28, No. 1, pp. 1-5, July 2010.

Swinney, M.W., McClory, J.W., Petrosky, J.C., Yang, Shan, Brant, A.T., Adamiv, V.T., Burak, Ya. V., Dowben, P.A., and Halliburton, L.E., “Identification of electron and hole traps in lithium tetraborate ($\text{Li}_2\text{B}_4\text{O}_7$) crystals: Oxygen vacancies and lithium vacancies,” *Journal of Applied Physics*, Vol. 107, Issue 11, article no. 113715, June 2010.

Williams, C.S., Baker, W.P., Burggraf, L.W., Adamson, P.E., and Petrosky, J.C., “Toward Simultaneous 2D ACAR and 2D DBAR: Sub-pixel Spatial Characterization of a Segmented HPGe Detector Using Transient Charges,” *IEEE Transactions on Nuclear Science*, Vol. 57, No. 2., 2 April 2010, pp. 860-869.

Schultz, David, Blasy, Bryan, Colon Santana, Juan, Petrosky, J.C., McClory, J.W., LaGrafte, D., Brand, J.I., Tang, Jinke, Wang, Wendong, Schemm, N., Balkir, S., Bauer, M., Ketsman, I., Fairchild, R.W., Losovyj, Ya. B., and Dowben, P.A., "The K-shell Auger Electron Spectrum of Gadolinium Obtained Using Neutron Capture in a Solid State Device," *Journal of Physics D*, Vol. 43, Issue 7, article no. 075502, 5 February 2010.

Ketsman, I., Wooten, D., Xiao, J., Losovyj, Ya. B., Burak, Ya. V., Adamiv, V.T., Sokolov, A., Petrosky, J., McClory, J., and Dowben, P.A., "The off-axis pyroelectric effect observed for lithium tetraborate," *Physics Letters A*, Vol. 374, pp. 891-895, 6 January 2010.

Wooten, D., Ketsman, I., Xiao, Jie, Losovyj, Ya. B., Petrosky, J., McClory, J., Burak, Ya. V., Adamiv, V.T., and Dowben, P.A., "The Surface Core Level Shift for Lithium at the Surface of Lithium Borate," *Physica B: Condensed Matter*, Vol. 405, Issue 1, pp. 461-464, 1 January 2010.

Moran, J., McClory, J., Petrosky, J., and Farlow, G., "The Effects of Temperature and Electron Radiation on the Electrical Properties of AlGaIn/GaN HFETs," *IEEE Transactions on Nuclear Science*, Vol. 56, No. 6, pp. 3223-3228, December 2009.

Petrosky, J., McClory, J., Gray, T., and Uhlman, T., "Trap-Assisted Tunneling Induced Currents in Neutron Irradiated AlGaIn/GaN HFETs," *IEEE Transactions on Nuclear Science*, Vol. 56, No. 5, pp. 2905-2909, October 2009.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Williams, C.S., Burggraf, L.W., Adamson, P.E., Petrosky, J.C., and Oxley, M.E., "Simultaneous, Coincident 2-D ACAR and DBAR Using HPGe Detector Incorporating Sub-pixel Interpolation," Advanced Science Research Symposium, Journal of Physics: Conference Series, Vol. 225, No. 1, article no. 012058, June 2010.

Williams, C.S., Slaughter, R., Burggraf, L.W., Adamson, P.E., Ross, M., and Petrosky, J.C., "Positron Annihilation Lifetime Spectroscopy of Dodecaborate Cage Molecules in Aqueous Nitrate Solutions," Proceedings of the 2009 IEEE Nuclear Science Symposium and Medical Imaging Conference, Orlando, FL, 25-31 October 2009.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Member, American Nuclear Society Risk Management Working Group.

Member, Nuclear Engineering Heads Organization.

Member, IEEE TNS/Plasma Physics.

Chairman, Graduate Nuclear Engineering Program.

Chair, QASPR Review Committee.

Invited talk on "Oxygen-atom Defects in 6H Silicon Carbide Implanted Using 24 MeV O³⁺ Ions Measured Using Three-dimensional Positron Annihilation Spectroscopy System (3DPASS)," Williams, C.S., Duan, X., Petrosky, J.C., and Burggraf, L.W., presented at the 21st International Conference on the Application of Accelerators in Research and Industry, Fort Worth, TX, 11 August 2010.

Estep, N.A., Petrosky, J., McClory, J., Kim, Y., and Terzuoli, A., "Electromagnetic Interference (EMI) and Ionizing Radiation Effects on CMOS Devices," presented at the IEEE Nuclear and Space Radiation Effects Conference, Denver, CO, 20-23 July 2010.

Kowash, B.R., Rockrohr, R.L., Burggraf, L.W., Petrosky, J.C., and McClory, J., “Estimating Source Position in Sealed Shipping Canisters Using Gamma Ray Spectra From a Portable HPGe Detector,” presented at the 2010 Symposium on Radiation Measurements and Applications, Ann Arbor, MI, 24-28 May 2010.

McClory, J.W., Young, C.M., Kowash, B.R., and Petrosky, J.C., “Solid State Neutron Detection with a Gadolinium Oxide and p-type Silicon Heterojunction,” presented at the 2010 Symposium on Radiation Measurements and Applications, Ann Arbor, MI, 24-28 May 2010.

Young, C.M., Mikina, J.K., McClory, J.W., and Petrosky, J.C., “Gate Bias Dependent Neutron Radiation Effects on AlGaIn/GaN Heterojunction Field Effect Transistors,” presented at the Hardened Electronics and Radiation Technology Conference, Tucson, AZ, 20-23 April 2010.

Estep, N.A., McHale, S.R., McClory, J.W., and Petrosky, J.C., “Ionizing Radiation Effects on CMOS HEX Inverter Performance,” presented at the Hardened Electronics and Radiation Technology Conference, Tucson, AZ, 20-23 April 2010.

McHale, S.R., Wooten, D.J., McClory, J.W., Petrosky, J.C., and Losovj, Ya. B., “Photoemission study of Au-Schottky barrier formation on YbGaIn thin films using synchrotron radiation,” presented at the Materials Research Society Spring Meeting, San Francisco, CA, 5-9 April 2010.

Nuclear Weapons Center, “Everything You Wanted To Know About EMP,” 12 February 2010.

AFRL/RBX, “Nuclear Weapons Generated Electromagnetic Pulse: Hardening and Testing,” 20 January 2010.

McHale, S.R., Wooten, D.J., McClory, J.W., and Petrosky, J.C., “Photoemission study of Au-Schottky barrier formation on AlGaIn using synchrotron radiation,” presented at the American Vacuum Society Annual Symposium, San Jose, CA, 9-13 November 2009.

McClory, J., Blasy, B., Schultz, D., Petrosky, J., Tang, J., Wang, Z., Brand, J., and Dowben, P., “Neutron Detection Using Gd-doped HfO₂/Silicon Heterojunctions,” presented at the 2009 IEEE Nuclear Science Symposium, Orlando FL, 25-31 October 2009.

McClory, John, Petrosky, James, and Moran, Jeffrey, “The Effect of Silicon Nitride Passivation on the Electrical Properties of Neutron and Electron Radiated AlGaIn/GaN HFETs,” presented at the IEEE Nuclear Science Symposium, Orlando, FL, 25-31 October 2009.

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 and American Geophysical Union. Tel. 937-255-3636 x4695 (DSN 785-3636 x4695), email: Robb.Randall@afit.edu

REFEREED JOURNAL PUBLICATIONS

Fiorino, S.T., Randall, R.M., Bartell, R.J., Downs A.D., Chu, P., and Fan, C.W., “Climate Change: Anticipated Effects on High Energy Laser Weapon Systems in Maritime Environments,” early online release, *Journal of Applied Meteorology and Climatology*, September 2010. [CDE]

Fiorino, S.T., Bartell, R.J., Krizo, M.J., McClung, B., Cohen, J.J., Randall, R.M., and Cusumano, S.J., “Broad Spectrum Optical Turbulence Assessments from Climatological Temperature, Pressure, Humidity, and Wind,” *Journal of Directed Energy*, Vol. 3, No. 3, pp. 223-238, January 2010. [CDE]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Fiorino, S.T., Randall, R.M., Bartell, R.J., Haiducek, J.D., Spencer, M.F., and Cusumano, S.J., "Field Measurements and Comparisons to Simulations of High Energy Laser Propagation and Off-Axis Scatter," *Proceedings of SPIE*, Vol. 7814, article no. 781424, SPIE Optics and Photonics, San Diego, CA, August 2010. [CDE]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Fiorino, S.T., Randall, R.M., Ranney, D.P., Bartell, R.J., Krizo, M.J., Cusumano, S.J., and Magee, E.P., "Band Model and Surface Observation Input Updates to the LEEDR Atmospheric Characterization Package," 32nd Review of Atmospheric Transmission Models Meeting, Lexington, MA, 14 June 2010. [CDE]

Magee, E.P., Fiorino, S.T., Randall, R.M., Ranney, D.P., Bartell, R.J., Krizo, M.J., and Cusumano, S.J., "Models for Laser Propagation using Customized LEEDR Atmospheric Characterization," 32nd Review of Atmospheric Transmission Models Meeting, Lexington, MA, 14 June 2010. [CDE]

Fiorino, S.T., Randall, R.M., Echeverria, F., Bartell, R.J., Krizo, M.J., and Cusumano, S.J., "High Energy Laser Tactical Decision Aid (HELTDA) for Predictive Avoidance," 5th DEPS Systems Symposium, Monterey, CA, 12-16 April 2010. [CDE]

Fiorino, S.T., Randall, R.M., Bartell, R.J., Downs, A., Chu, P., and Fan, C.W., "Climate Change: Anticipated Effects on HEL Weapon Systems in Maritime Environments," Directed Energy Professional Society 12th Annual DE Symposium, San Antonio, TX, 2-6 November 2009. [CDE]

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 radiation effects, nonlinear optical materials, electron paramagnetic resonance spectroscopy, and laser processing of materials. Before joining the AFIT faculty, Dr. Ries served as Director of the Center for Materials Research at Norfolk State University in Norfolk, Virginia, and Associate Director of the Applied Research Center at the Jefferson Center for Research and Technology Research Park in Newport News, Virginia. She was elected to the ASEE Engineering Research Council Board of Directors in 2008 and has served on the Engineering and Science Foundation of Dayton Board since 2005. Tel. 937-255-3636 x4544 (DSN 785-3636 x4544), email: Heidi.Ries@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

"AFOSR/MOA Speaker Fund." Sponsor AFOSR. Funding: \$5,465.

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: \$29,253.

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., LTC,

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. Before 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 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

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Sheely, E.V., Burggraf, L.W., Adamson P.E., Duan, X.F., and Schmidt M.W., "Application of GAMESS/NEO to quantum calculations of muonic molecules," *Journal of Physics: Conference Series*, Vol. 225, No. 1, article no. 012049, 25 June 2010 (oral presentation given by Eugene Sheely at the Advanced Science Research Symposium 2009, Positron, Muon, and other exotic particle beams for materials and atomic/molecular sciences, Mito, Japan, 10-12 November 2009).

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

McClory, John, and Sheely, Eugene, "AFIT Graduate Nuclear Engineering and Combating WMD Programs," presented at the DTRA Detailee Training Conference, Fort Belvoir, VA, 14-16 October 2009.

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 include applications of active and passive remote sensing, spectroscopy, diagnostics, and signals processing to problems in intelligence collection and exploitation. Other areas of interest include nuclear weapon effects and space nuclear power systems modeling and mechanics of aerosols. He has published in both unclassified and classified refereed archival journals and conference proceedings. Tel. 937-255-3636 x4536 (DSN 785-3636 x4536), email: Ronald.Tuttle@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

"ARL Technical Assistance Program (TAP)." Sponsor: US Army Research Laboratory. Funding: \$125,000. [CMSR]

"Chief Technology Officer (CMSR)." Sponsor: SAF. Funding: \$362,000. [CMSR]

"Counterspace Research & Academic Support." Sponsor: NASIC. Funding: \$271,456. [CMSR]

"Hyperspectral Technical Assistance Program (HyTAP)." Sponsor: AFRL/RV. Funding: \$200,000. [CMSR]

"Project Incubator." Sponsor: NASIC. Funding: \$520,000. [CMSR]

"Project Lake Effect." Sponsor: NASIC. Funding: \$515,000. [CMSR]

"Project Seven- Phase I." Sponsor: OSD. Funding: \$29,000. [CMSR]

"Project Seven- Phase II & III." Sponsor: NASIC. Funding: \$150,000. [CMSR]

"Space Analysis Resource Catalog (SpARC)." Sponsor: NASIC. Funding: \$82,998. [CMSR]

SPONSOR FUNDED EDUCATIONAL PROJECTS

“Advanced Geospatial Intelligence Education.” Sponsor: NASIC. Funding: \$450,000. [CMSR]

“Reentry Course: Phase I Startup.” Sponsor: NASIC. Funding: \$15,000. [CMSR]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Borel, Christoph C., and Tuttle, Ronald F., “Improving the detectability of small spectral targets through spatial filtering,” *Proceedings of SPIE*, Vol. 7812, pp. 78120K, 2010. [CMSR]

Borel, Christoph C., Tuttle, Ronald F., and Spencer, Clyde, “Improved panchromatic sharpening of multi-spectral image data,” *Proceedings of SPIE*, Vol. 7812, pp. 78120G, 2010. [CMSR]

Borel, Christoph C., McGrellis, Robert, Juhl, Jonathan, and Tuttle, Ronald F., “Automatic processing of gait video and extraction of features,” paper published in Proceedings of BAMS/ASTS, Laurel, MD, 31 August – 2 September 2010. [CMSR]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Borel, Christoph C., McGrellis, Robert, Juhl, Jonathan, and Tuttle, Ronald F., “Automatic processing of gait video and extraction of features,” talk presented at the BAMS/ASTS meeting, Laurel, MD, 31 August – 2 September 2010. [CMSR]

Dea, J., Fisher, K., Mendenhall, M., Tuttle, R., Weeks, D. (Chair), Chrissis, J., Cunningham, W., Heminger, A., Wirthlin, R., and Paschall, R., “The Implications of the State of Ohio’s Universities Move to a Semester Based System,” Report of the 2009-2010 Faculty Council Ad Hoc Committee, 11 March 2010. [CMSR]

Tuttle, Ronald F., and Hemminger, Donald, “Educating the Air Force Digital Native,” AETC Symposium, San Antonio, TX, 14-15 January 2010. [CMSR]

WALLI, KARL, Lt Col,

Assistant Professor of Engineering Physics, Department of Engineering Physics, AFIT Appointment Date: 2010 (AFIT/ENP); BS, Electrical Engineering, Michigan Technological University; MS, Strategic Intelligence, National Defense Intelligence College, 1995; MS, Imaging Science, Rochester Institute of Technology, 2003; PhD, Imaging Science, Rochester Institute of Technology, 2010. Lt Col Walli has been assigned to the National Reconnaissance Office on two separate occasions, where he helped acquire the country’s next generation of Space Imaging systems. Additionally, he has been involved with Measurement and Signatures Intelligence (MASINT)-related remote sensing for 10 years, serving both in DIA’s Central MASINT Organization and the National Air and Space Intelligence Center and within EUCOM’s 26th Intelligence Group. He has published and presented his research into automatic image registration techniques at SPIE, IEEE, and ASPRS conferences. Tel. 937-255-3636 x4333 (DSN 785-3636 x4333), email: Karl.Walli@afit.edu.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Walli, Karl, “Airborne Synthetic Terrain Generation (AeroSynth),” Proceedings of the ASPRS/MAPPS Specialty Conference, San Antonio, TX, November 2009.

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 compute associated state to state reactive scattering matrix elements. Of particular interest are new methods that incorporate non-adiabatic coupling between electronic and nuclear degrees of freedom. Tel. 937-255-3636 x4561 (DSN 785-3636 x4561), email: David.Weeks@afit.edu

REFEREED JOURNAL PUBLICATIONS

Duan, X., Wei, J., Burggraf, L., and Weeks, D., "Mapping ground-state properties of silicon carbide molecular clusters using quantum mechanical calculations: Si_mC_n and Si_mC_n^- ($m, n \leq 4$)," *Computational Materials Science*, Vol. 47, pp. 630-644, January 2010.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Blank, L.A., Kedziora, G.S., and Weeks, D.E., "Potential Energy Surfaces for Alkali Plus Noble Gas Pairs – A Systematic Comparison," *Proceedings of SPIE*, Vol. 7581, article no. 75810I(1-8), 2010, SPIE Photonics West, San Francisco, CA, 25-29 January 2010. [CDE]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Chair, Ohio Section of the American Physical Society, 2009-2010.

Weeks, D.E., and Barger, L.A., Non-Adiabatic Molecular Dynamics of $\text{B}+\text{H}_2$, Spring 2010 Meeting of the Ohio-Region Section of the APS, Flint, MI, 30 April – 1 May 2010.

Weeks, D.E., and Barger, L.A., "Effective Potential Energy Surfaces for the Inelastic Collision $\text{B}(^2\text{P}_{1/2}) + \text{H}_2(n, j) \leftrightarrow \text{B}(^2\text{P}_{3/2}) + \text{H}_2(n', j')$," APS March Meeting, Portland, OR, 15-19 March 2010.

Dea, J., Fisher, K., Mendenhall, M., Tuttle, R., Weeks, D. (Chair), Chrissis, J., Cunningham, W., Heminger, A., Wirthlin, R., and Paschall, R., "The Implications of the State of Ohio's Universities Move to a Semester Based System," Report of the 2009-2010 Faculty Council Ad Hoc Committee, 11 March 2010.

WILLIAMS, CHRISTOPHER, Lt Col,

Assistant Professor of Engineering Physics, Department of Engineering Physics, AFIT Appointment Date: 2010 (AFIT/ENP); BS, University of Connecticut at Storrs, 1994; MS, University of Alabama at Tuscaloosa, 1999; MS, Air Force Institute of Technology; PhD, Air Force Institute of Technology, 2010. Lt Col Williams' research focuses on spectroscopy methods, both gamma and positron annihilation. Before joining AFIT, he was the Lead Project Officer for the W80 and W84 Nuclear Warhead Project Officer's Group where he led an 80-plus person joint Department of Defense and Energy Team to meet Presidential and warfighter requirements and directed and managed a \$2.5 billion W80 Warhead Life Extension. His current work includes studies of ion-implanted SiC using a simultaneous measurement technique incorporating two conventional positron annihilation spectroscopy techniques. He is a member of the American Nuclear Society and Tau Beta Pi. Tel. 937-255-3636 x4689 (DSN 785-3636 x4689), email: Christopher.Williams@afit.edu

REFEREED JOURNAL PUBLICATIONS

Williams, C.S., Baker, W.P., Burggraf, L.W., Adamson, P.E., and Petrosky, J.C., "Toward Simultaneous 2D ACAR and 2D DBAR: Subpixel Spatial Characterization of a Segmented HPGe Detector Using Transient Charges," *IEEE Transactions on Nuclear Science*, Vol. 57, No. 2, pp. 860-869, 2 April 2010.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Williams, C.S., Burggraf, L.W., Adamson, P.E., Petrosky, J.C., and Oxley, M.E., “Simultaneous, Coincident 2-D ACAR and DBAR Using HPGe Detector Incorporating Sub-pixel Interpolation,” Advanced Science Research Symposium, *Journal of Physics: Conference Series*, Vol. 225, No. 1, article no. 012058, June 2010.

Williams, C.S., Slaughter, R., Burggraf, L.W., Adamson, P.E., Ross, M., and Petrosky, J.C., “Positron Annihilation Lifetime Spectroscopy of Dodecaborate Cage Molecules in Aqueous Nitrate Solutions,” Proceedings of the 2009 IEEE Nuclear Science Symposium and Medical Imaging Conference, Orlando, FL, 25-31 October 2009.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Invited talk on “Oxygen-atom Defects in 6H Silicon Carbide Implanted Using 24 MeV O^{3+} Ions Measured Using Three-dimensional Positron Annihilation Spectroscopy System (3DPASS),” Williams, C.S., Duan, X., Petrosky, J.C., and Burggraf, L.W., presented at the 21st International Conference on the Application of Accelerators in Research and Industry, Fort Worth, TX, 11 August 2010.

Burggraf, L.W., Duan, X.F., Roberts, Jr., J.W., and Williams, C.S., “Oxygen Bonding in SiC Clusters and Solid State SiC; Comparisons of Quantum Computations with Positron Spectroscopy,” High Performance Computation Supercomputer Users Group Conference, Chicago, IL, 14 June 2010.

Burggraf, L.W., Williams, C.S., Adamson, P.E., Slaughter, R.C., Ross, M.A., Duan, X.F., and Roberts, J.W., “Applications of Positron Chemistry and Positron Annihilation Spectroscopy at AFIT,” AFOSR Molecular Dynamics Contractor’s Meeting, May 2010.

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. Tel. 937-255- 0452 (DSN 785-0452), email: Paul.Wolf@afit.edu

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Ohio Section of the American Physical Society, Executive Committee – Council Representative.

Higher Learning Commission, Consultant-Evaluator.

Midwest Association of Graduate Schools – Chair, Publications Committee.

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 and several technical reports, presented more than 200 papers at professional conferences, and holds one patent. He is a reviewer for the Applied Physics Letters, Journal of Applied Physics, Journal of Electronic Materials, and Air Force Office of Scientific Research (AFOSR) proposal. He is currently funded by the AFOSR to study narrow to wide band gap semiconductors, such as GeSn and SiGeSn, InGaAs and InAsP, and ZnO. This work involves collaborative effort with the University of Arizona State, University of Delaware, Air Force Research Laboratory, University of Rensselaer Polytechnic Institute, and Rutgers University. He has directed the research of 7 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 the General Bernard A. Schriever Award for 1997. Tel. 937-255-3636 x4532 (DSN 785-3636 x4532), email: Yung.Yeo@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

“Investigation of Optical and Electrical Properties of Bulk InGaAs & InAsP for Optoelectronic Device Applications.” Sponsor: AFOSR. Funding: \$100,000.

“Investigation of Optical and Electrical Properties of GeSn and SiGeSn Material Systems for the Si-based Light Emitter Applications.” Sponsor: AFOSR. Funding: \$196,200.

REFEREED JOURNAL PUBLICATIONS

Moore, E.A., Yeo, Y.K., Gruen, G.J., Ryu, Mee-Yi, and Hengehold, R.L., “Temperature-Dependent Studies of Si-Implanted $\text{Al}_{0.33}\text{Ga}_{0.67}\text{N}$ with Different Annealing Temperature and Times,” *Journal of Electronic Materials*, Vol. 39, pp. 21-28, 2010.

Moore, E.A., Yeo, Y.K., Hengehold, R.L., and Ryu, Mee-Yi, “Activation Studies of Si-Implanted $\text{Al}_{0.45}\text{Ga}_{0.55}\text{N}$ by Using Cathodoluminescence and Temperature-Dependent Hall-Effect Measurements,” *Journal of the Korean Physical Society*, Vol. 55, pp. 2465-2469, December 2009.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Served as an International Advisory Committee member of the 30th International Conference on the Physics of Semiconductors.

Jeon, H.C., Lee, S.J., Kang, T.W., Park, S.H., Yeo, Yung Kee, and George, T.F., “Internal Electric Fields due to Piezoelectric and Spontaneous Polarizations in CdZnO/MgZnO Quantum Well,” presented at the 30th International Conference of Physics of Semiconductors, Seoul, Korea, 25-30 July 2010.

Jeon, H.C., Lee, S.J., Kang, T.W., Chang, K.J., Yeo, Yung Kee, and George, T.F., “Magnetic Property due to an Embedded Mn Delta Doping Layer in (Ga,Mn)N Thin Films,” presented at the 30th International Conference of Physics of Semiconductors, Seoul, Korea, 25-30 July 2010.

Bergstrom, A.C., Wei, J.W., Yeo, Y.K., Guha, S., Rajagopalan, G., Ryu, M.Y., and Hengehold, R.L., “Optical and Electrical Characterization Studies of Bulk $\text{In}_x\text{Ga}_{1-x}\text{As}$ with High Indium Mole Fraction,” presented at the 30th International Conference of Physics of Semiconductors, Seoul, Korea, 25-30 July 2010.

Harris, Thomas R., Guha, Shekhar, Yeo, Yung Kee, Gonzalez, Leo, Carpenter, Amelia, and Hengehold, Robert, “Infrared Absorption Measurements of GaAs, GaSb, and InAs at Elevated Temperatures,” presented at the Spring 2010 Meeting of the Ohio Section of the American Physical Society, Flint, MI, 30 March – 1 April 2010.

Bergstrom, Austin, Wei, Jean, Yeo, Yung Kee, Guha, Shekhar, Gonzalez, Leo, Hengehold, Robert, Dutta, Partha, and Rajagopalan, Geeta, "Optical and Electrical Characterization of Bulk-Grown Ternary $\text{In}_x\text{Ga}_{1-x}\text{As}$," presented at the March 2010 Meeting of the American Physical Society, Seattle, WA, 15-19 March 2010.

5.4. DEPARTMENT OF MATHEMATICS AND STATISTICS

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5.4.1. DOCTORAL DISSERTATIONS

MILLS, DAVID T., *Consistency Properties for Growth Model Parameters Under an Infill Asymptotics Domain*. AFIT/DAM/ENC/10-1. Faculty Advisor: Dr. Edward D. White. Sponsor: N/A.

5.4.2. MASTER'S THESES

DOOLEY, ALAINA D., *Screening Techniques and Randomization Restrictions in Wind Tunnel Testing, Using Design of Experiments*. AFIT/GAM/ENC/10-01. Faculty Advisor: Maj Shay R. Capehart. Sponsor: AEDC/XP.

JACK, DENNIS E., *Contract Over Target Baseline (OTB) Effect on Earned Value Management's Cost Performance Index (CPI)*. AFIT/GCA/ENC/10-02. Faculty Advisor: Dr. Edward D. White. Sponsor: PMI College of Performance Management.

LYNN, JESSE L., *Heat and Current Propagation in Buggered Super-Conducting and Hyper-Conducting Wire*. AFIT/GAM/ENC/09-02. Faculty Advisor: Lt Col Kyle A. Novak. Sponsor: N/A.

THICKSTUN, KRISTINE E., *Predicting Over Target Baseline (OTB) Acquisition Contracts*. AFIT/GCA/ENC/10-01. Faculty Advisor: Dr. Edward D. White. Sponsor: PMI College of Performance Management.

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

SPONSOR FUNDED RESEARCH PROJECTS

“Pulse Forensics Enhanced Real-time De-interleaving (HORSE).” Sponsor: AFRL/RY. Funding: \$28,000. [COA]

REFEREED JOURNAL PUBLICATIONS

Williams, C. S., W. P. Baker, L. W. Burggraf, P. E. Adamson, and J. C. Petrosky, Toward simultaneous 2D ACAR and 2D DBAR: Sub-pixel spatial characterization of a segmented HPGe detector using transient charges, *IEEE Transactions on Nuclear Science* **57**, No. 2 (2010), 860-869.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Paek, G., W. Baker, W., and A. Palazotto, “Surface temperature and melt profile due to frictional heating,” Dayton-Cincinnati Aerospace Science Symposium, Dayton, OH, March, 2010.

Easterday, O., A. Palazotto, R. Branam, and W. Baker, “Characterization of thermal barrier coatings at elevated temperature in a free-free System,” Dayton-Cincinnati Aerospace Science Symposium, Dayton, OH, March, 2010.

Easterday, O., A. Palazotto, R. Branam, and W. Baker, “A unique experimental device for evaluating damping properties of thermal barrier coatings at elevated temperatures,” 51st AIAA SDM Conference, Orlando, FL, April, 2010.

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.,

Associate Professor of Statistics, Department of Mathematics and Statistics, AFIT Appointment Date: 2004, (AFIT/ENC); BS, University of Maryland at College Park, 1996; PhD, University of California, Berkeley, 2001. Dr. Bulutoglu's research interests include design of experiments and combinatorial problems in statistics. His papers 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

REFEREED JOURNAL PUBLICATIONS

Ryan, K. J. and D. A. Bulutoglu, Minimum aberration fractional factorial designs with large N, *Technometrics* **52** (2010), 250-255.

Bulutoglu, D. A. and D. M. Kaziska, Improved WLP and GWP lower bounds based on exact integer programming, *Journal of Statistical Planning and Inference*, **140** (2010), 1154-1161.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Reviewer, *Operations Research, Journal of Statistical Planning and Inference, Statistica Sinica, Journal of Statistical Theory and Practice*.

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.

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

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

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

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Reviewer, *Journal of Computational and Applied Mathematics*

Deployed as Deputy Chief, Operations Assessment Team, Combined Air and Space Operations Center Strategy Division, Air Forces Central (Southwest Asia), January – July 2010.

DILLARD, KAREN E. M., Lt Col,

Assistant Professor of Mathematics and Deputy Department Head, 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

FICKUS, MATTHEW C.,

Associate 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

SPONSOR FUNDED RESEARCH PROJECTS

“Frames and Quantitative Redundancy.” Sponsor: AFOSR. Funding: \$79,915.

“Functional Analysis for Passive Navigation and Surveillance.” Sponsor: AFOSR. Funding: \$68,145.

“Fusion Frames for Distributed Processing and Communication.” Sponsor: AFOSR. Funding: \$24,959.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Bhagavatula, R., M. Fickus, W. Kelly, C. Guo, J. A. Ozolek, C. A. Castro and J. Kovacevic, Automatic identification and delineation of germ layer components in H&E stained images of teratomas, *Proceedings of the IEEE International Symposium on Biomedical Imaging* (2010), 1041-1044.

Balcan, D. C., G. Srinivasa, M. Fickus and J. Kovacevic, Convergence behavior of the Active Mask algorithm, *Proceedings of the IEEE International Conference on Acoustics, Speech Signal Processing* (2010), 453-456.

Chebira, A., M. Fickus and M. Vetterli, Frame domain signal processing: framework and applications, *Proceedings of the IEEE International Conference on Acoustics, Speech Signal Processing* (2010), 4094-4097.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Massar, M. L., R. Bhagavatula, M. Fickus and J. Kovacevic, Local histograms for classifying H&E stained tissues, *Proceedings of the Southern Biomedical Engineering Conference* (2010), 4 pages.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Reviewer, *Acta Applicandae Mathematicae, Advances in Computational Mathematics, Applied Computational Harmonic Analysis, IEEE Transactions on Information Theory, Journal of Fourier Analysis and Applications, Linear Algebra and its Applications, and Proceedings of the Southern Biomedical Engineering Conference.*

Fickus, M., “Filter bank fusion frames,” INSPIRE Conference on Information Representation and Estimation, London, United Kingdom, September, 2010.

Fickus, M., “Local histograms and image occlusion models,” AFOSR Program Review on "Sensing, Surveillance and Navigation," Waltham, Massachusetts, June, 2010.

Fickus, M., “Fusing multimodal images with frame theory,” Quantitative Methods in Defense and National Security, Fairfax, VA, May, 2010.

Fickus, M., “Finding nearby unit norm tight frames,” Norbert Wiener Center Conference on "From Banach Spaces to Frame Theory and Applications," College Park, MD, May, 2010.

Fickus, M., “Information fusion and frame theory,” AFOSR Workshop on Frames and Compressive Sensing, Arlington, VA, May, 2010.

Fickus, M., “Filter bank fusion frames,” AMS National Meeting, Special Session on "Optimal Frames and Operator Algebras," San Francisco, CA, January, 2010.

Fickus, M., "Filter bank fusion frames," Illinois/Missouri Applied Harmonic Analysis Seminar, St. Louis, MO, November, 2009.

Fickus, M., "Filter bank fusion frames," AFOSR Program Review on "Information Fusion and Distributed Intelligence," Arlington, VA, October, 2009.

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

REFEREED JOURNAL PUBLICATIONS

Lair, A. V., A necessary and sufficient condition for the existence of large solutions to sublinear elliptic systems, *Journal of Mathematical Analysis and Applications* **365** (2010), 103-108.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Reviewer, *Mathematical Reviews*.

NOVAK, KYLE A., Lt Col,

Assistant Professor of Mathematics, 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.

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

SPONSOR FUNDED RESEARCH PROJECTS

"Fusion of Disparate Sensor Exploitation Systems." Sponsor: AFOSR. Funding: \$52,000. [COA]

"Qualia Exploitation of Sensor Technology for Structural Health Management." Sponsor: AFRL/RB. Funding: \$50,000. [CCR]

"Sensor Fusion, Tracking, Tools and Consulting." Sponsor: NASIC. Funding: \$15,000. [COA]

REFEREED JOURNAL PUBLICATIONS

Parker, David R., Steven C. Gustafson, Mark E. Oxley, and Timothy D. Ross, Development of a Bayesian framework for determining uncertainty in receiver operating characteristic curve estimates, *IEEE Transactions on Knowledge and Data Engineering* **22**, No. 1 (2010), 31-45.

Williams, C. S., L. W. Burggraf, P. E. Adamson, J. C. Petrosky, and M. E. Oxley, Simultaneous , coincident 2-D ACAR and DBAR using HPGe detector incorporating sub-pixel interpolation,” *Journal of Physics: Conference Series* **225** No. 1 (2010), paper no. 012058, 8 pages.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Oxley, Mark E., Christine M. Schubert, and Steven N. Thorsen, Confidence of a ROC manifold, *Proceedings of SPIE, Signal Processing, Sensor Fusion, and Target Recognition XIX* **7697** (2010), 76970T-1-12.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Williams, Christopher S., Larry W. Burggraf, Mark E. Oxley, James C. Petrosky, Paul E. Adamson, Simultaneous 2-D ACAR and DBAR using segmented HPGe detectors incorporating sub-pixel interpolation, *International Symposium on Advanced Science Research Symposium 2009* (ASR2009), Tokai, Japan, November, 2009.

Reynolds, M. Brent, Kenneth M. Hopkinson, Mark E. Oxley, and Barry E. Mullins, Node Gradient: An Effective and Efficient Heuristic for Service Oriented Infrastructure Resource Allocation, *IEEE 6th World Congress on Services*, Miami FL, July, 2010.

Referee, *Applied Optics*, *Journal of Sensors*, *Journal of Advances in Information Fusion*, and *Military Operations Research*.

POND, KEVIN R., Capt,

Assistant Professor of Mathematics, Department of Mathematics and Statistics, AFIT Appointment Date: 2010. (AFIT/ENC); BS, Mathematical Science, The University of Texas at Dallas, 2003; MS, Mathematical Science, The University of Texas at Dallas, 2005; PhD, Mathematics, Virginia Polytechnic and State University, 2010. Capt Pond's primary research interests include numerical methods, finite element methods, and uncertainty quantification. He has served as an Air Force analytical scientist operationally testing and evaluating the CV-22 and MQ-9 platforms. Tel. 937-255-3636 x4630 (DSN 785-3636x4630), email: Kevin.Pond@afit.edu

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Referee, *Optimization and Engineering*.

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

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 KABBAN, CHRISTINE M.,

Assistant Professor of Statistics, Department of Mathematics and Statistics, AFIT Appointment Date: 2010 (AFIT/ENC); BA, University of Dayton, 1992; MBA, Wright State University, 1994; MS Wright State University, 1995; PhD, Air Force Institute of Technology, 2005. Dr. Schubert's research interests include classification techniques, ROC curve theory and extensions, information fusion, longitudinal modeling, regression and regression extensions, 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.schubertkabban@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

“Towards the Validity and Calibration of Sensor Prediction of Structural Damage.” Sponsor: AFRL/RB. Funding: \$17,950.

REFEREED JOURNAL PUBLICATIONS

Perez, F.J., Schubert, C.M., Parvez, B., Pathak, V., Ellenbogen, K.A., Wood, M.A. Long-term outcomes after catheter ablation of cavo-tricuspid isthmus dependent atrial flutter: A meta-analysis. *Circulation: Arrhythmia and Electrophysiology*, **2**, No. 4 (2009), 393-401. PMCID: PMID19808495.

Schubert, C.M., Sun, S.S., Burns, T.L., Morrison, J.A., Huang, T.T. Predictive ability of childhood metabolic components for adult metabolic syndrome and type 2 diabetes. *Journal of Pediatrics* **155**, No. 3 (2009), S6.e1-7. PMCID: PMID19732565.

Schubert, C.M., Cook, S., Sun, S.S., Huang, T.T. Additive utility of family history and waist circumference to body mass index in childhood for predictions of metabolic syndrome in adulthood. *Journal of Pediatrics* **155**, No 3 (2009), S6.e9-13. PMCID: PMID19732567.

Sun, S.S., Schubert, C.M. Prolonged juvenile states and delay of cardiovascular and metabolic risk factors: The Fels Longitudinal Study. *Journal of Pediatrics* **155**, No. 3 (2009), S7.e1-6. PMCID: PMID 19732568.

Bajaj, J.S., Saeian, K., Schubert, C.M., Hafeezullah, M., Franco, J., Varma, R.R., Gibson, D.P., Hoffmann, R.G., Stravitz, R.T., Heuman, D.M., Sterling, R.K., Shiffman, M., Topaz, A., boyett, S., Bell, D., Sanyal, A.J. Minimal hepatic encephalopathy is associated with motor vehicle crashes: the reality beyond the driving test. *Hepatology* **50**, No. 4 (2009), 1175-1183. PMCID: PMID19670416.

Biegel, G.M., Brown, K.W., Shapiro, S.L., Schubert C.M., Mindfulness-based stress reduction for the treatment of adolescent psychiatric outpatients. *Journal of Consulting and Clinical Psychology* **77**, No 5) (2009), 855-866. PMCID: PMID19803566.

Chumlea, W.M.C., Schubert, C.M., Towne, B., Siervogel, R.M., Sun, S.S. Left ventricular mass, abdominal circumference and age: The Fels Longitudinal Study. *The Journal of Nutrition, Health & Aging* **13**, No. 9 (2009), 821-825. PMCID: PMID19812873.

Chen C, Hill, L.D., Schubert, C.M., Strauss, J.F., Matthews, C.A. Is laminin gamma1 (LAMC1) a candidate gene for advanced pelvic organ prolapse? *American Journal of Obstetrics and Gynecology* **202**, No. 5 (2010), 505 e1-5. PMCID: PMID 20223449.

Lyon, D.E., Schubert, C., Taylor, A.G. Pilot study of cranial stimulation for symptom management in breast cancer. *Oncology Nursing Forum* **37**, No. 4 (2010), 476-483. PMCID: PMID20591807.

Bajaj, J.S., Schubert, C.M., Heuman, D.M., Wade, J.B., Gibson, D.P., Topaz, A., Saeian, K., Hafeezullah, M., Bell, D.E., Sterling, R.K., Stravitz, R.T., Luketic, V., White, M.B., Sanyal, A.J. Persistence of cognitive impairment after resolution of overt hepatic encephalopathy. *Gastroenterology* **138** (2010), 2332-2340. PMCID: PMID20178797.

Barker, S.B., Knisely, J.S., McCain, N.L., Schubert, C.M., Pandurangi, A.K. Exploratory study of stress response patterns to interaction with a therapy dog. *Anthrozoos* **23**, No.1 (2010), 79-91.

Matthews, C.A., Schubert, C.M., Woodward, A.P., Gill, E.J. Variance in abdominal wall anatomy and port placement in women undergoing robotic gynecologic surgery. *The Journal of Minimally Invasive Gynecology* **17** (2010), 583-586. PMID: 20598650.

Bajaj, J.S., Schubert, C.M., Heuman, D.M., Wade, J.B., Gibson, D.P., Topaz, A., Saeian, K., Haffeezullah, M., Bell, D.E., Sterling, R.K., Stravitz, R.T., Luketic, V., White, M.B., Sanyal, A.J. Persistence of cognitive impairment after resolution of overt hepatic encephalopathy. *Gastroenterology* **138** (2010), 2332-2340. PMID: 20178797.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Reviewer, *Biometrical Journal*, *Council for the Advancement of Nursing Science*.

SIPE, JEFFREY A., Capt,

Instructor of Statistics, Department of Mathematics and Statistics, AFIT Appointment Date: 2009 (AFIT/ENC); BS, Angelo State University, 2001; MS, Air Force Institute of Technology, 2003; MS, Duke University, 2008. Capt Sipe's primary research interests include Bayesian inference and non-parametric function estimation. He served as an Air Force Signals Intelligence analyst for 9 years, and as an Air Force analytical scientist for 8 years.

WARR, RICHARD L., Maj,

Assistant Professor of Statistics, Department of Mathematics and Statistics, AFIT Appointment Date: 2010 (AFIT/ENC); BS, Southern Utah University, 1996; MA, University of Nebraska at Omaha, 2005; MS, University of New Mexico, 2009; PhD, University of New Mexico, 2010. Maj Warr's research interests include reliability, semi-Markov processes, Bayesian statistics and model fit assessment. Tel. 937-255-3636 x4669 (DSN 785-3636 x4669), email: Richard.Warr@afit.edu

WHITE, EDWARD D., III,

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

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Co-Editor, *Journal of Cost Analysis and Parametrics*.

Referee, *Journal of Cost Analysis and Management*.

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

SPONSOR FUNDED RESEARCH PROJECTS

“Real-Time Combat Navigation System and Virtual Battlespace.” Sponsor: AFOSR. Funding: \$20,720.

REFEREED JOURNAL PUBLICATIONS

Peterson, J., D. Smith, and A. Wood, Large solutions of coupled sublinear/superlinear elliptic equations, *Applicable Analysis* **89**, No. 6 (2010), 905-914.

McGuirk, J., P. Collins, M. Havrilla, and A. Wood, A Green's Function Approach to Calculate Scattering Width for Cylindrical Cloaks, *ACES Journal* **25**, No. 2 (2010), 108-116.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

C. Schrock and A. Wood, Distributional direct simulation Monte Carlo methods, *Proceedings of the AIAA Annual Conference* (2010), 10 pages.

C. Schrock and A. Wood, Distributional collision modeling for Monte Carlo simulation, *Proceedings of 27th Rarefied Gas Dynamics Symposium* (2010), 6 pages.

5.5. DEPARTMENT OF OPERATIONAL SCIENCES

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5.5.1	<u>DOCTORAL DISSERTATIONS</u>	164
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5.5.1. DOCTORAL DISSERTATIONS

LOEFFELHOLZ, BERNARD J., *Neural Extensions to Robust Parameter Design*. AFIT/DS/ENS/10-03.
Faculty Advisor: Dr. Kenneth W. Bauer. Sponsor: NASIC.

5.5.2. MASTER'S THESES

BOERBOOM, JASON S., *A Linear Programming Approach for Determining Travel Cost Minimizing ECSS Training Locations*. AFIT/GCA/ENS/10-01. Faculty Advisor: Dr. Jeffrey A. Ogden. Sponsor: AF/A4IT.

CANCINO, PAUL A., *Comparison of War Readiness Engine Repair Network Integration Metrics for the B-1B Lancer F-101-GE-102 Engine*. AFIT/LSCM/ENS/10-01. Faculty Advisor: Dr. Raymond R. Hill.
Sponsor: N/A.

CARDOSO, FABIO A., *Stealthy River Navigation in Jungle Combat Conditions*. AFIT/LSCM/ENS/10-02.
Faculty Advisor: Dr. Alan W. Johnson. Sponsor: N/A.

COTE, MICHAEL D., *Screening and Sufficiency in Multiobjective Decision Problems with Large Alternative Sets*. AFIT/OR/MS/ENS/10-12. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: JFCC-ISR DJS-5.

DIRIK, NECIP, *Maximizing Strike Planning Efficiency for a Given Class of Targets*. AFIT/OR/MS/ENS/10-01. Faculty Advisor: Dr. James T. Moore. Sponsor: N/A.

FLOSI, DAVID A., *An Exploratory Case Study of Program Development within the USAF Nuclear Enterprise*. AFIT/LSCM/ENS/10-03. Faculty Advisor: Dr. Jeffrey A. Ogden. Sponsor: HQ USAF/A4.

GARZA, RICARDO A., *A Simulation Based Methodology to Examine the B-1B's AN/ALQ-161 Maintenance Process*. AFIT/LSCM/ENS/10-04. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: N/A.

GOODRICH, PRESTON L., *Delivery Time Variance Reduction in the Military Supply Chain*. AFIT/OR/MS/ENS/10-02. Faculty Advisor: Dr. James T. Moore. Sponsor: HQ AMC/A9.

HA, TAEGYUN, *The UAV Continuous Coverage Problem*. AFIT/OR/MS/ENS/10-03.
Faculty Advisor: Dr. Youcef Kebir. Sponsor: N/A.

HASTINGS, ERIC W., *Using Remotely Piloted Aircraft to Support National Technical Nuclear Forensics*. AFIT/OR/MS/ENS/10-04. Faculty Advisor: Lt Col Stephen P. Chambal. Sponsor: AFTAC.

JEONG, GREG S., *A Multi-Objective Approach to a Bipartite Assignment Matching Problem Using Weighted Values from Multiple Constraints*. AFIT/OR/MS/ENS/10-05. Faculty Advisor: Dr. Jeffrey D. Weir. Sponsor: 369 RCS.

KIM, CHANG-SUNG, *Measuring the Effect of Transportation Uncertainty in the Postponement Strategy*. AFIT/LSCM/ENS/10-05. Faculty Advisor: Lt Col Doral E. Sandlin. Sponsor: N/A.

KIM, DAEWON, *Korean Domestic Third Party Logistics Providers: Research for a Global Market*. AFIT/LSCM/ENS/10-06. Faculty Advisor: Dr. William A. Cunningham. Sponsor: N/A.

KIMAZ, EVREN, *Fuel Efficiency Assessment with DEA*. AFIT/LSCM/ENS/10-07. Faculty Advisor: Dr. Alan W. Johnson. Sponsor: HQ AMC/A3.

LEE, BENJAMIN, *An Empirical Study of Re-sampling Techniques as a Method for Improving Error Estimates in Split-plot Designs*. AFIT/OR/MS/ENS/10-06. Faculty Advisor: Dr. Raymond R. Hill.
Sponsor: N/A.

MacKENZIE, ADAM S., *An Exploration of the Effects of Maintenance Manning on Combat Mission Readiness Utilizing Agent Based Modeling*. AFIT/OR/MS/ENS/10-07. Faculty Advisor: Dr. John O. Miller. Sponsor: AFGLSC.

MONTOYA, GABRIEL ALEJANDRO, *Assessing Resilience in Power Grids as a Particular Case of Supply Chain Management*. AFIT/LSCM/ENS/10-08. Faculty Advisor: Maj Daniel D. Mattioda. Sponsor: N/A.

MORIAS, JOSE M., *Emergency Management Benchmarking Study: Lessons for Increasing Supply Chain Resilience*. AFIT/LSCM/ENS/10-09. Faculty Advisor: Lt Col Timothy J. Pettit. Sponsor: N/A.

PARK, ANSON R., *Simulation Analysis of High Velocity Maintenance for the B-1B*. AFIT/OR/MS/ENS/10-08. Faculty Advisor: Dr. John O. Miller. Sponsor: SCMG.

PARSON, CARL R., *Simulation Modeling and Analysis of TNMCS for the B-1 Strategic Bomber*. AFIT/OR/MS/ENS/10-09. Faculty Advisor: Dr. John O. Miller. Sponsor: AFGLSC.

PASSEY, ANDREW J., *Modeling the Effects of Information Operations on Integrated Air Defense Systems*. AFIT/OR/MS/ENS/10-10. Faculty Advisor: Dr. John O. Miller. Sponsor: NASIC.

REHMERT, PHILLIP M., *Manpower Cost Analysis of a Distributed En Route Support Structure Versus a Consolidated En Route Support Structure*. AFIT/LSCM/ENS/10-10. Faculty Advisor: Dr. William A. Cunningham. Sponsor: HQ AMC/A9.

TOBIN, BRIAN P., *Supply Chain Resilience: Assessing USAF Weapon System Life Cycle*. AFIT/LSCM/ENS/10-11. Faculty Advisor: Lt Col Timothy J. Pettit. Sponsor: AFGLSC.

TOYDAS, MURAT, *Fuel Savings Opportunities from Air Refueling*. AFIT/LSCM/ENS/10-12. Faculty Advisor: Dr. Alan W. Johnson. Sponsor: N/A.

YAVUZ, MURAT, *Optimizing an F-16 Squadron Weekly Pilot Schedule for the Turkish Air Force*. AFIT/OR/MS/ENS/10-11. Faculty Advisor: Dr. James T. Moore. Sponsor: N/A.

5.5.3. GRADUATE RESEARCH PAPERS

BUCH, GEORGE M., JR., *AMC's Next Strategic Airlifter: The Blended Wing Body?* AFIT/IMO/ENS/10-01. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: HQ AMC.

CARTER, REBECCA L., *Consolidation of MOBAGS: The Quest for Efficiency in Logistics Operations*. AFIT/IMO/ENS/10-02. Faculty Advisor: Dr. William A. Cunningham. Sponsor: HQ USAF/A4.

CASEY, BRANDON A., *Airlift Cargo Hub Port Hold Times: Controlling Variations in Defense Supply Chain Delivery*. AFIT/IMO/ENS/10-03. Faculty Advisor: Dr. James T. Moore. Sponsor: HQ AMC.

DONAGHY, MICHAEL R., *Application of a Non-linear Program to the Establishment of a Hub and Spoke System in Africa*. AFIT/IMO/ENS/10-04. Faculty Advisor: Dr. James T. Moore. Sponsor: USAFE/A8Z.

DUPIS, PAUL L., *Leading Edge Systems; Integrating ALIS with ECSS*. AFIT/ILS/ENS/10-02. Faculty Advisor: Maj Daniel D. Mattioda. Sponsor: N/A.

FAIRCHILD, IAN M., *Securing Information Exchange Between the TACC and Its Civilian Airlift Partners*. AFIT/IMO/ENS/10-05. Faculty Advisor: Dr. Robert F. Mills. Sponsor: AFCENT.

FORINO, JOHN T., *Examining Benefits of Dedicated Funding and Process Improvement for Depot Level Technology Insertion*. AFIT/ILS/ENS/10-03. Faculty Advisor: Lt Col Timothy A. Pettit. Sponsor: HQ AFMC/A4.

FRIEDEL, JESSE J., *An Aggregate Assessment of Newer Technology G Suits*. AFIT/IOA/ENS/10-02. Faculty Advisor: Lt Col Stephen P. Chambal. Sponsor: N/A.

GRAY, MYERS S., *The Effects of Cargo Height Distribution on B-747 and C-17 Airlift*. AFIT/IMO/ENS/10-06. Faculty Advisor: Dr. James T. Moore. Sponsor: HQ AMC.

GREGG, AIMEE N., *Optimizing Crisis Action Planning in the Noncombatant Evacuation Operation Setting*. AFIT/IOA/ENS/Y09-03. Faculty Advisor: Maj Shane N. Hall. Sponsor: EUCEC/EC.

HENNINGER, TODD A., *Characterization of Ballistic Impact Flash: An Initial Investigation and Methods Development*. AFIT/IOA/ENS/10-4. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: 46 TG/OL-AC.

HUNTER, TRACY N., *Performance of Military Cargo Aircraft Using Required Navigation Performance Departures*. AFIT/IOA/ENS/10-07. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: HQ AFFSA/A3.

JACOBS, VINCENT M., *Analysis of C-17 Departure Reliability and Maintenance Metrics*. AFIT/IMO/ENS/10-07. Faculty Advisor: Maj Shay R. Capehart. Sponsor: HQ AMC.

LEVIEN, ANDREW J., *Restructuring Depot Maintenance Occupational Series to Improve Flexibility*. AFIT/ILS/ENS/10J-03. Faculty Advisor: Lt Col Timothy J. Pettit. Sponsor: HQ AFMC/A4.

MILLS, JASON T., *DSCA: General Population Evacuation of Texas and Louisiana*. AFIT/IMO/ENS/10-08. Faculty Advisor: Dr. William A. Cunningham. Sponsor: ACC/QI.

MOE, CRAIG D., *What is the best use(s) and mission(s) of the C-27J?* AFIT/IMO/ENS/10-09. Faculty Advisor: Dr. James T. Moore. Sponsor: HQ AMC.

MORRISON, PHILIP G., *Reballasting the KC-135 Fleet for Fuel Efficiency*. AFIT/IMO/ENS/10-10. Faculty Advisor: Maj Daniel D. Mattioda. Sponsor: HQ AMC.

OMDAL, CHRISTOPHER N., *Air Cargo Tenders: Theater Express for the World*. AFIT/IMO/ENS/10-11. Faculty Advisor: Dr. William A. Cunningham. Sponsor: HQ AMC.

RITZEL, SCOTT M., *Depot Maintenance Transformation: Successful Strategies in Capital Investing*. AFIT/IDE/ENS/10J-04. Faculty Advisor: Lt Col Timothy A. Pettit. Sponsor: HQ AFMC/A4.

SETTLE, JASON R., *Blue Survivability Against a Command Guided Air-to-Air Missile*. AFIT/IOA/ENS/Y09-05. Faculty Advisor: Dr. John O. Miller. Sponsor: NASIC.

SJOSTEDT, TRAVIS D., *Active Associate Units; Benefits and Drawbacks*. AFIT/IMO/ENS/10-12. Faculty Advisor: Dr. Alan R. Heminger. Sponsor: HQ AMC.

SMITH, ADAM R., *Blue Survivability Against a Command Guided Air-to-Air Missile*. AFIT/IOA/ENS/Y09-06. Faculty Advisor: Dr. John O. Miller. Sponsor: NASIC.

STUART, TIMOTHY J., *Coronet vs. Cargo: A Study into Increasing the Usage of Tanker Assets for Cargo Movement on Coronet Positioning and De-Positioning Legs*. AFIT/IMO/ENS/10-13. Faculty Advisor: Dr. James T. Moore. Sponsor: N/A.

SURDYK, BRIAN A., *An Analysis of Time Series Forecasting Methods for the Airlift of Palletized Sustainment*. AFIT/IMO/ENS/10-14. Faculty Advisor: Dr. James T. Moore. Sponsor: HQ AMC.

WEBER, ERIC S., *Rated Force Management Metrics: KC-10 Case Study*. AFIT/IMO/ENS/10-17. Faculty Advisor: Maj Daniel D. Mattioda. Sponsor: ASC.

WILLIAMS, JASON T., *Tactical Unmanned Airlift, A Business Case Study*. AFIT/IMO/ENS/10-16. Faculty Advisor: Maj Daniel D. Mattioda. Sponsor: HQ AMC.

5.5.4. FACULTY RESEARCH OUTPUT

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

AHNER, DARRYL K., LTC,

Assistant Professor of Operations Research, Department of Operational Sciences, AFIT Appointment Date 2010; BS, United States Military Academy, 1990; MS, Rensselaer Polytechnic Institute, 1999; MS, Rensselaer Polytechnic Institute, 1999; PhD, Boston University, 2005. LTC Ahner's research interest include applied probability, sequential decision making under uncertainty, model predictive control of complex UAV and sensor systems. Tel 937-255-6565 x4708 (DSN 785-6565 x4708), email: Darryl.Ahner@afit.edu.

SPONSOR FUNDED RESEARCH PROJECTS

"Impact of Individual Augmentees Study." Sponsor: OSD. Funding: \$220,000. [COA]

ANDERSON, BRADLEY E., Lt Col,

Assistant Professor of Logistics Management, Department of Operational Sciences, AFIT Appointment Date: 2002 AFIT/ENS); Chief, Logistics Division; 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 reparable inventory management, mixed integer programming, network models, supply chain management, and evolutionary algorithms. As of November 2010, Lt Col Anderson is serving in Korea.

BAUER, KENNETH W.,

Professor of Operations Research, Department of Operational Sciences, AFIT Appointment Date: 1996 (AFIT/ENS); Director, Sensor Fusion Laboratory; 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.

SPONSOR FUNDED RESEARCH PROJECTS

"Advanced Research in Automatic Target Recognition." Sponsor: NASIC. Funding: \$200,000. [COA]

"Advanced Research in Automatic Target Recognition." Sponsor: CMD/ARSTRAT. Funding: \$25,000. [COA]

"Advanced Research in Automatic Target Recognition." Sponsor: AFRL/RV. Funding: \$50,000. [COA]

"Sensor Fusion for Automatic Target Recognition." Sponsor: AFRL/RV. Funding: \$50,000. [COA]

REFEREED JOURNAL PUBLICATIONS

Yuri P. Taitano, Brian A. Geier, and Kenneth W. Bauer Jr., "A Locally Adaptable Iterative RX Detector," EURASIP Journal on Advances in Signal Processing, vol. 2010, Article ID 341908, 10 pages, 2010. doi:10.1155/2010/341908. [COA]

Bellucci, J.P., Smetek, T.E., and K.W. Bauer, "Improved Hyperspectral Image Processing Algorithm Testing Using Synthetic Imagery and Factorial Designed Experiments," IEEE Transactions on Geoscience and Remote Sensing, Vol. 48, No. 3, March 2010, pp. 1211-1223. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Loeffelholz, Bernard J. and Kenneth W. Bauer, "An Examination into Robust Parameter Design," In the Proceedings of the Huntsville Simulation Conference, Huntsville, AL, 27-29 Oct 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

Program Director, Operations Research Doctoral Program, Department of Operational Sciences.

Director, Sensor Laboratory, Department of Operational Sciences.

Member of Best Paper Committee, ANNIE Conference 2009, St. Louis, Mo.

BURNS, KEVIN E., Col,

Assistant Professor of Operations Research, Department of Operational Sciences, AFIT Appointment Date: 2009 (AFIT/ENS); Senior Military Professor, Graduate School of Engineering and Management; BS, Mathematical Sciences, US Air Force Academy, 1988; MS, Mathematics, University of North Carolina, 1993; PhD, Business Administration, University of Georgia, 1998. Col Burn's research interests include mathematic modeling, reliability and queuing modeling and theory, optimization, and parametric analysis. Tel. 937-255-3636 x4621 (DSN 785-3636 x4621), email: Kevin.Burns@afit.edu. As of September 2010, Col Burns is serving on deployment in the Middle East.

CHAMBAL, STEPHEN P., Lt Col,

Associate Professor of Operations Research., Department of Operational Sciences, AFIT Appointment Dates: 1999-2003, 2008 (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.

SPONSOR FUNDED RESEARCH PROJECTS

"AEDC Study." Sponsor: HQ AFMC. Funding: \$185,000. [COA]

"AFIT/ENS Support to the Air Force Technical Applications Center." Sponsor: AFTAC. Funding: \$10,000. [COA]

"OSD CAPE Research Proposal." Sponsor: OSD. Funding: \$100,000. [COA]

SPONSOR FUNDED EDUCATIONAL PROJECTS

"DOE Education Support to the JSTARS Program." Sponsor: JSTARS. Funding: \$10,000. [COA]

"DOE Revitalization." Sponsor: HQ AFMC. Funding: \$357,271. [COA]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Associate Editor – Military Operations Research .

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.

SPONSOR FUNDED RESEARCH PROJECTS

"B-2 Wing Analysis." Sponsor: AFMC. Funding: \$50,000. [COA]

REFEREED JOURNAL PUBLICATIONS

Kevin T. Kennedy, Richard F. Deckro, Victor P. Wiley and James W. Chrissis "On Modeling and Analyzing Multi-Layered Networks," *Military Operations Research*, Vol. 14, No. 3, (2009), pp. 53-66. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

T. Paciencia and J. Chrissis, "An Optimization Method for Stochastic Systems with Multiple Objectives," 13th AIAA/ISSMO Multidisciplinary Analysis and Optimization Conference, 13-15 Sept 2010, Ft Worth, TX. [COA]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Program Director, Operations Research Master's Program, Department of Operational Sciences.

Senior Member American Institute of Aeronautics and Astronautics (AIAA).

President, Cincinnati-Dayton Chapter of INFORMS; presently organized more meetings and chapter functions than previous presidents in recent memory. Submitting a proposal to the INFORMS New Initiatives call for proposals to support, expand, and extend the OR-Ohio activities.

Invited to speak at the "Stochastic Optimization," 78th MORSS Tutorial, Quantico, VA, 21 June 2010.

Chaired a session of six papers on Structural and Materials Optimization at the 13th AIAA/ISSMO Multidisciplinary Analysis and Optimization (MAO) Conference, Ft. Worth, Texas.

MDO Technical Committee Secretary, of the AIAA Multidisciplinary Design Optimization (MDO) Technical Committee (TC).

Session chair at the January 2010 AIAA Aerospace Sciences Meeting in Orlando, FL.

Track Leader (MDO Applications), 13th AIAA/ISSMO Multidisciplinary Analysis and Optimization Conference, 13-15 Sept 2010, Ft Worth, TX – responsible for 65 paper/abstract reviews and sessioning of those papers; sessioned another approximately 50 papers.

Committee chair and reviewer of approximately 60 applications for scholarships/grants provided by the Buckeye Chapter of AHEPA (American Hellenic Educational Progressive Association).

Reviewed papers submitted for the April 2010 AIAA SDM Conference/MDO Specialist Conference in Orlando, FL.

Reviewed papers for the MDO sessions at the January 2011 AIAA Aerospace Sciences Meeting in Orlando, FL.

Reviewed papers for Military Operations Research.

Reviewed papers for European Journal of Operational Research.

Reviewed papers for Simulation.

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.

REFEREED JOURNAL PUBLICATIONS

Kokangul, A., Khaniyev, T., and Cochran J.K., "Optimal Control of Work-In-Process Inventory of a Two-Station Production Line," *Optimal Control, Applications, and Methods* 31:3, pp. 201-211 (2010). [COA]

Cochran, J.K. and Broyles, J.R., "Developing Nonlinear Queuing Regressions to Increase Emergency Department Patient Safety: Approximating Reneging with Balking," *Computers and Industrial Engineering* 59:3, pp. 378-386 (2010). [COA]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Award for Meritorious Civilian Service, Department of the Air Force, 2010.

HQ AETC Inspector General 'Top 5% Professional Performer,' 2009 Unit Compliance Inspection.

Editorial Board, Computers in Industry.

Editorial Board, Journal of Design and Manufacturing Automation.

Editorial Board, International Journal of Simulation and Process Modelling.

Editorial Board, International Journal of Industrial and Systems Engineering.

Editorial Board, International Journal of Mathematics in Operational Research.

Senior Member of the Institute of Industrial Engineers.

Senior Member of the Society for Computer Simulation.

Selected and served on the National Science Foundation Peer Review Panel, Fall 2009, for CAREER Grant Selection of the Service Enterprise Systems Program.

Member, Council of Industrial Engineering Department Heads, CIEDH, representing the Department of Operational Sciences, Air Force Institute of Technology.

Member, Association of Chairs of Operations Research Departments, ACORD, representing the Department of Operational Sciences, Air Force Institute of Technology.

Served on the Program Committee, IASTED International Conference on Modeling and Simulation.

Member of INFORMS.

Member of American Society for Engineering Education.

CUNNINGHAM, WILLIAM A.,

Professor of Logistics and Supply Chain 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.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Bell, John, Stanley Griffis, and William Cunningham, "Location Analysis: A Strategic Network for
Homeland Defense," Proceedings of the 2010 Western Decision Sciences Annual Meeting, Lake Tahoe,
NV April 6-9, 2010. This paper won the Best Paper Award from all papers submitted to Western DSI.
[COA]

Bell, John E., Joseph B. Skipper, William A. Cunningham, Daniel D. Mattioda, and Krista LaPietra (April 6-
9 2010), "Location Consolidation of Military Equipment for Deployment," Proceedings of the 2010
Western Decision Science Institute Annual Meeting, Lake Tahoe, NV. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

"An Optimization of the Hub-and-spoke Distribution Network in United States European Command,"
Stephan Brady, Lt Col Ben Skipper, William Cunningham. 2009 INFORMS Annual Meeting in San
Diego, California, November 2009. [COA]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Program Director, Logistics and Supply Chain Management Master's Program, Department of Operational
Sciences

Editorial Review Board – Air Force Journal of Logistics.

Editorial Review Board - Journal of Transportation Management.

Book Reviewer for Army Logistician.

National Testing Committee - American Society of Transportation & Logistics.

INFORMS Southern Regional Conference, 5-7 April 2010, Huntsville AL (E. Kiymaz, A. Johnson, and W.
Cunningham), "Fuel Efficiency Assessment with DEA." [COA]

DECKRO, RICHARD F.,

Professor of Operations Research, Department of Operational Sciences, AFIT Appointment Date: 1994 (AFIT/ENS); Director, Future Operations Investigation Laboratory, BSIE, State University of New York at Buffalo, 1972; MBA, Kent State University, 1973; DBA, in Decision Sciences, 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), email: Richard.Deckro@afit.edu.

REFEREED JOURNAL PUBLICATIONS

Kevin T. Kennedy, Richard F. Deckro, Victor P. Wiley and James W. Chrissis "On Modeling and Analyzing Multi-Layered Networks," *Military Operations Research*, Vol. 14, No. 3, (2009), pp. 53-66.

Jennifer L. Geffre, Richard F. Deckro & Shane A. Knighton, "Determining Critical Members of Layered Operational Terrorist Networks," *The Journal of Defense Modeling & Simulation*, Vol. 6 No. 2, (2009), pp. 97 – 109.

Michael J. Artelli, Richard F. Deckro, Daniel J. Zalewski, Sonia E. Leach, & Marcus B. Perry, "A Dynamic Approach for Modeling Elements of Modern Conflict," *Military Operations Research*, Vol. 14 No. 2, (2009), pp. 51 - 74.

Michael J. Artelli, Richard F. Deckro, Daniel J. Zalewski, Sonia E. Leach, and Marcus B. Perry, "A Control Theory Model of Deployed Soldiers' Morale," *International Journal of Operational Research*, Vol. 7, No.1, (2010), pp. 31 - 53.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

"Optimal Scheduling of Overlapping Phases in the Concurrent/Simultaneous Engineering Approach to New Product Development," John E. Hebert and Richard F. Deckro, Western Decision Science Institute, Lake Tahoe, April 2010.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Director, Future Operations Investigation Laboratory (FOIL).

Chair, AFIT Faculty Council Academic Resource Committee.

Editor, Military Operations Research.

Organized and chaired MAS Sponsored Session entitled "Human Network Analysis: Social Networks in Conflicts" at INFORMS San Diego.

Dick Deckro, James Morris, Doneda Downs & Jerry O'Neal, "Selecting and Effecting Key Measures and Methods in Counter IED Network Operations," AtN Working Group, November 2009.

Served as one of 3 judges for the 2009 Dr. Wilbur B. Payne Memorial Award for Excellence in Analysis (Army Award).

James Morris, Jerry O'Neal, Dick Deckro, "A Random Graph Generation Algorithm Designed for Social Network Analysis," INFORMS San Diego, October 2009.

Dick Deckro, "Applying Operations Research to Security, Stability, Transition, and Reconstruction Operations," The McNaughton Sessions Symposium, Royal Military College, Kingston ON.

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) Committee, by its initial authorization, committee ended 12/2009.

Peer Evaluator for research proposals for Cognitive, Information and Network Science Basic and Applied Sciences Directorate, Defense Threat Reduction Agency, September 2009 & March 2010.

Member, MORS Publication Committee.

Member, MORS Heritage Committee.

Member, Peacekeeping and Stability Operations Institute Academic Consortium.

Dick Deckro, "Service Before Self," AFIT Faculty Development Monthly Seminar, 3 June 2010.

DONOVAN, PAMELA S.,

Assistant Professor of Logistics and Supply Chain Management, Department of Operational Sciences, AFIT Appointment Dates: 2006 (AFIT/ENS); BS, Kent State University, 1986; MS, Air Force Institute of Technology, 1996; PhD, University of Maryland, 2006. Dr. 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.

SPONSOR FUNDED RESEARCH PROJECTS

"CRAF Study." Sponsor: HQ AMC. Funding: \$175,000. [COA]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Program Director, Supply Chain Management Certificate Program, Department of Operational Sciences.

FRIEND, MARK A., Maj,

Assistant Professor of Operations Research, Department of Operational Sciences,, AFIT Appointment Date: 2010 (AFIT/ENS); Chief, Operations Research Division; BS, Computer Science, Texas Christian University, 1996; MS, Operations Research, Air Force Institute of Technology, 1998; PhD, Operations Research, Air Force Institute of Technology, 2007. Major Friend's research interests include pattern recognition techniques applied to the area of automatic target recognition, applied multivariate statistics, and mobility modeling and analysis. Tel. 937-255-3636 x4624 (DSN 785-3636 x4624), email: Mark.Friend@afit.edu.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Division Chief, Operations Research Division, Department of Operational Sciences.

HALL, SHANE N., Maj,

Assistant Professor of Operations Research, Department of Operational Sciences, AFIT Appointment Date: 2006 (AFIT/ENS); Chief, Operations Research Division; 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. As of July 2010, Major Hall is serving at Scott Air Force Base, Illinois.

SPONSOR FUNDED RESEARCH PROJECTS

“Analysis of Noncombatant Evacuation Operations.” Sponsor: USEUCOM. Funding: \$45,920. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Roesener, A.G., Hall, S.N., and Özen, Y.G., 2010, “An Integer Programming Formulation for a Single Pallet in the Airlift Loading Problem with Insufficient Aircraft,” WORLDCOMP 2010 (The 2010 World Congress in Computer Science, Computer Engineering, and Applied Computing), Las Vegas, NV, July 12-15, 2010. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Jeong, G.S., Hall, S.N., and Weir, J.D., 2010, “A Multi-objective Approach to a Bipartite Assignment Matching Problem using Weighted Values from Multiple Constraints,” Working Groups 20 (Manpower and Personnel) and 31 (Computing Advances in OR), 78th Military Operations Research Society Symposium, Quantico, VA, June 21-24, 2010. [COA]

Hall, S.N., Roesener, A.G., and Özen, Y.G., 2010, “A Hybrid Genetic Algorithm Approach to the Airlift Loading Problem with Insufficient Aircraft,” ALIO-INFORMS Joint International Meeting, Buenos Aires, Argentina, June 6-9, 2010. Invited session. [COA]

Hall, S.N., Jacobson, S.H., and Sewell, E.C., 2009, “An Analysis of Pediatric Vaccine Formulary Selection Problems,” INFORMS Annual Meeting, San Diego, CA, October 11-14, 2009. Nominated: Pierskalla Award (best paper in health applications). [COA]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Division Chief, Operations Research Division, Department of Operational Sciences.

AFIT Graduate School - EN Commandant's Award Committee (Mar 2010).

Geyer, A.J., Hall, S.N., and Moore, J.T., 2009, “Operations-focused Optimized Theater Weather Sensing Strategies Using Preemptive Binary Integer Programming,” The McNaughton Sessions, Royal Military College, Kingston, Ontario, Canada. Invited speaker. [COA]

Reviewer for journal - Military Operations Research.

Reviewer for Winter Simulation Conference.

Scholarship Selection Committee, Seth Bonder Scholarship, Healthcare Application Section, INFORMS, 2009.

HEILMANN, SHARON G., Lt Col,

Assistant Professor of Logistics and Supply Chain Management, Department of Operational Sciences, AFIT
Appointment Date: 2004-2007 (AFIT/ENV), 2010 (AFIT/ENS); BS, Organizational Communication, Eastern Michigan University, 1988; MA, Organizational Communication, Ohio University, 1989; MS, Logistics Management, Air Force Institute of Technology, 1998; MB, Indiana University, 2003; PhD, Organizational Behavior & Human Resource Management, Indiana University, 2005. Lt Col Heilmann's research interests include organizational turnover, mentoring, training, and research methods. Tel. 937-255-3636 x4319 (DSN 785-3636 x4319), email: Sharon.Heilmann@afit.edu.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Invited reviewer, Human Resource Management Journal.

HILL, RAYMOND R.,

Professor of Operations Research, Department of Operational Sciences, AFIT Appointment Dates: 1997-2002, 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.

SPONSOR FUNDED RESEARCH PROJECTS

"Flash/Function Characterization Model." Sponsor: 780 TS/OL-AC. Funding: \$160,000. [COA]

REFEREED JOURNAL PUBLICATIONS

Aleman, R. E. and R. R. Hill. April 2010. A Tabu Search with Vocabulary Building Approach for the Vehicle Routing Problem with Split Demands. *International Journal of Metaheuristics*, Vol. 1, No. 1, 55-80. [COA]

Aleman, R., X. Zhang and R. R. Hill, June 2010. An Adaptive Memory Algorithm for the Split Delivery Vehicle Routing Problem. *Journal of Heuristics*, Vol. 16, No. 3, 441-473. [COA]

Champagne, L. E. and R. R. Hill, October 2009. A Simulation Validation Method Based on Bootstrapping Applied to an Agent-Based Model of the Bay of Biscay Historical Scenario. *Journal of Defense Modeling and Simulation: Applications, Methodology, Technology* Vol. 6, No. 4, 201-212. [COA]

Hardman, N., Colombi, J., Jacques, D., Hill, R., Miller, J. 2009. An Evaluation of Collision Avoidance Technologies Using Empirical Function Allocation. *International Journal of Applied Aviation Studies*, Vol. 9, No. 2, 133-154. [COA]

Heath, B. L., Ciarallo, F. and Hill, R. R. October 2009. A Survey of Agent-Based Modeling Practices (January 1998 to July 2008), *Journal of Artificial Societies and Social Simulation*, Vol. 12, No. 4, October 2009. [COA]

Hill, R. R. 2009. AFIT's Graduate-level Test and Evaluation Certificate Program, *Phalanx*, Vol. 42, No. 4, 35-36, December 2009. [COA]

Johnson, A., Heiman, T., Cooper, M., and Hill, R., 2010, "Assessing Transport Aircraft Inspection Strategies" *International Journal of Operations Research and Information Systems*. 1(4): 1-21. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Heath, B. L., Ciarallo, F. and R. R. Hill. June 2010. An Exploratory Agent-Based Model of Warehouse Picking Operations with Congestion, Abstract 781. Institute of Industrial Engineering Research Conference, Cancun, Mexico. [COA]

Hill, R. R. and D. A. Leggio, Feb 2010. A Monte Carlo Study Examining the Potential of Experimental Design Strategies for Wind Tunnel Testing. AIAA-2010-1715. USAF T&E Days, Nashville, TN, 2-4 February 2010. [COA]

Hardman, N, J. Colombi, D. Jacques, R. Hill and J. Miller, "Application of a Seeded Genetic Algorithm for User Interface Design." Proceedings of the IEEE Systems, Man, and Cybernetics Conference, San Antonio TX, October 2009. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Experimental Design Issues in LVC, Live Virtual Constructive 15th Annual Conference, El Paso, TX, January 11-14, 2010. [COA]

Examining Issues Associated with the use of Live, Virtual, Constructive (LVC) Simulation in Test and Evaluation, WG-2540, Military Operations Research Society Symposium, June 22-24, 2010, Quantico, VA, with E. Bjorkman and D. Hodson. [COA]

Using Live, Virtual, Constructive Distributed Simulation Environments for Analysis, WG-2553, Military Operations Research Society Symposium, June 22-24, 2010, Quantico, VA, with E. Bjorkman, D. Hodson, and M. Cerniglia-Mosher. [COA]

Using Live, Virtual, Constructive (LVC) Simulations to Conduct Test and Evaluation for System of Systems, WG-2547, Military Operations Research Society Symposium, June 22-24, 2010, Quantico, VA, with E. Bjorkman and D. Hodson. [COA]

BOOKS AND CHAPTERS IN BOOKS

Heath, Brian L. and Raymond R. Hill, "Agent-Based Modeling: A Historical Perspective and a Review of Validation and Verification Efforts" book chapter, Chapter 3, Handbook of Research on Discrete Event Simulation Environments: Technologies and Applications, edited by Evon Abu-Taieh, IGI Publishing, Hershey, PA, 2010. [COA]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Assistant Director, Operations Research Doctoral Program, Department of Operational Sciences.

Director, Text and Evaluations Certificate Program, Department of Operational Sciences.

Graduate School Doctoral Council Member.

Department of Operational Sciences Civilian Student Coordinator.

Oak Ridge Institute for Science and Education Program Coordinator.

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.

Guest Editor, Journal of Simulation special issue on Agent-Based Modeling.

2009 Winter Simulation Conference proceedings editor (over 311 papers).

Helped organize the Live, Virtual Constructive (LVC) in Distributed Environments track of the International Test and Evaluation Association (ITEA) LVC Conference in El Paso, Tx.

Published, along with Rene Seguin of the Canadian Operations Research Society, "MAS-CORS Cluster at the CORS-INFORMS Joint International Conference," a summary of the Military Applications track they organized, in the Military Operations Research periodical, Phalanx, Vol. 42, No. 3. [COA]

IIE Industrial Engineering Research Conference, 5-9 June 2010, Cancun Mexico (C. Guler, A. Johnson, M. Cooper, and R. Hill), "Energy Industry Economic Impacts from Ohio River Transportation Disruption." [COA]

Ohio Transportation Safety Awareness Seminar, 11 November 2009, Cincinnati OH (C. Guler, A. Johnson, M. Cooper, and R. Hill), "Coal Distribution Implications of Ohio River Disruption." [COA]

Hill, R. December 2009. The Importance of Mentorship – Part 1. EN the Know, AFIT/EN Newsletter, Vol. 2, No. 2.

Hill, R. March 2010. The Importance of Mentorship – Part 2. EN the Know, AFIT/EN Newsletter, Vol. 2, No. 3.

Hill, R. June 2010. The Importance of Mentorship – Part 3. EN the Know, AFIT/EN Newsletter, Vol. 2, No. 4.

JOHNSON, ALAN W.,

Associate Professor of Logistics and Supply Chain Management, Department of Operational Sciences, AFIT
Appointment Date: 2004 (AFIT/ENS); 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.

REFEREED JOURNAL PUBLICATIONS

Vann, L., Anderson, B., and Johnson, A.W., 2009, "Feasibility of JP-8 to Jet A fuel conversion at U.S. military facilities" *Journal of Transportation Management* 20(1): 59-72. [COA]

Johnson, A., Heiman, T., Cooper, M., and Hill, R., 2010, "Assessing Transport Aircraft Inspection Strategies" *International Journal of Operations Research and Information Systems*. 1(4): 1-21. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Ford, T., Ogden, J., and Johnson, A., "A Method for Measuring Supply Chain Interoperability," Proceedings of the IIE Industrial Engineering Research Conference, Cancun, Mexico, 5-9 Jun 10. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Molina, C., Johnson, A., and Roesener, A., "Reusable Launch Vehicle Design Implications for Regeneration Time." Proceedings of the American Institute of Aeronautics and Astronautics Space 2009 Conference, Pasadena CA, AIAA-2009-6471. [COA]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Program Director, Logistics Doctoral Program, Department of Operational Sciences.

Program Director, Supply Chain Management Certificate Program, Department of Operational Sciences

Elected as the chair for the American Institute of Aeronautics and Astronautics (AIAA) Space Logistics Technical Committee, effective 1 September 2010. This is a two year appointment.

Associate Editor, IIE Transactions.

Secretary/Treasurer, Military Applications Society, INFORMS.

Session Chair (4 presentations), INFORMS National Meeting, 11-13 Oct 09, San Diego CA.

Program Co-chair, Industrial Engineering Research Conference (IIE Annual Conference), Cancun Mexico, 5-9 June 2010.

Presentations Chair, Space Logistics Technical Committee, American Institute of Aeronautics and Astronautics.

Member of the Editorial Board, International Journal of Operations Research and Information Systems (IJORIS).

Manuscripts reviewer for European Journal of Operational Research.

Co-editor (with J.O. Miller), Proceedings of the 2010 IIE Industrial Engineering Research Conference, Cancun, Mexico, 5 – 9 June 2010

Participated with the AFIT delegation to Singapore on 25-27 August. In addition to the group tours and discussions, he also met with the Singapore Air Force Senior Principal Engineer and Deputy Head for Air Logistics, ME7 Francis, on operations research and logistics graduate education opportunities with AFIT.

IIE Industrial Engineering Research Conference, 5-9 June 2010, Cancun Mexico (C. Guler, A. Johnson, M. Cooper, and R. Hill), “Energy Industry Economic Impacts from Ohio River Transportation Disruption.” [COA]

INFORMS Southern Regional Conference, 5-7 April 2010, Huntsville AL (E. Kiymaz, A. Johnson, and W. Cunningham), “Fuel Efficiency Assessment with DEA.” [COA]

Presentation to AMC/A3/A9, 12 February 2010, Scott AFB IL (E. Kiymaz and A. Johnson), “C-17 Fuel Efficiency Measurement.” [COA]

Ohio Transportation Safety Awareness Seminar, 11 November 2009, Cincinnati OH (C. Guler, A. Johnson, M. Cooper, and R. Hill), “Coal Distribution Implications of Ohio River Disruption.” [COA]

INFORMS National Meeting, October 11-13 2009, San Diego CA (C. Molina, A. Johnson, and A. Roesener), “Reusable Launch Vehicle Design Implications.” [COA]

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. As of May 2010, Dr. Kebir is serving in private industry.

MATTIODA, DANIEL D., Maj,

Assistant Professor of Logistics Management and Supply Chain Management, Department of Operational Sciences, AFIT Appointment Date: 2007 (AFIT/ENS); 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. Major Mattioda’s research interests include collaboration and flexibility in the supply chain; reverse logistics; international logistics; lean, agile logistics; and using simulation to model supply chain processes. As of June 2010, Major Mattioda is serving at Kunsan Air Base, Korea.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Mattioda, Daniel D., Samir Barman, Warren F. Fisher, Joseph B. Skipper (2009), "Controlled Release Location of Jobs in a Hybrid Job/Flow Shop Environment," Huntsville Simulation Conference, Huntsville, AL. [COA]

Bell, John E., Joseph B. Skipper, William A. Cunningham, Daniel D. Mattioda, and Krista LaPietra (April 6-9 2010), "Location Consolidation of Military Equipment for Deployment," Western Decision Science Institute Annual Meeting, Lake Tahoe, NV. [COA]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Program Director, Logistics (Air Mobility) Master's Program, Department of Operational Sciences.

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; Director, Combat Modeling Laboratory; 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.

SPONSOR FUNDED RESEARCH PROJECTS

"Research, Analysis and Transition Support to the Air Force Global Logistics Support Center." Sponsor: AFGLSC. Funding: \$208,400. [COA]

REFEREED JOURNAL PUBLICATIONS

Ponack, Ryan and Miller, J.O. "Capability Assessment of the High Energy Liquid Laser Area Defense System (HELLADS)," *Journal of Directed Energy*, Vol 3 No. 3, pp. 193-209, Winter 2009. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Bednar, E. M., and Miller, J.O. "Player vs. Bot Traffic Analysis Using Artificial Neural Networks," *Proceedings of Industrial Engineering Research Conference 2010*, Cancun, Mexico, 5-9 June 2010. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Passey, A.J., and Miller, J.O. "Modeling IO Effects with HELIOS," 78th MORS Symposium, Quantico, VA, 21-24 June 2010. [COA]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Director, Combat Modeling Laboratory.

Associate Editor for International Journal of Operations Research.

Co-chaired the 2010 Industrial Engineering Research Conference as part of the Institute of Industrial Engineering (IIE) Annual Conference that took place in Cancun Mexico June 5 - 9. Program consisted of over 900 presentations (over 400 of these including a peer reviewed paper) covering 20 different tracks with new tracks for Industrial Engineering E(IE) in the Military and IE in Latin America.

OR-Ohio Lead representative for AFIT. Attended meetings and tutorials this year at The Ohio State University (13 Nov 2009), Wright State University (12 Feb 2010), and the University of Cincinnati (28 May 2010).

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.

Member AF Modeling and Simulation Workforce Development Working Group.

MOORE, JAMES T.,

Professor of Operations Research, Department of Operational Sciences, AFIT Appointment Dates: 1990-1998, 1998 (AFIT/ENS); 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, transportation modeling, and mobility modeling. Tel. 937-255-3636 x4528 (DSN 785-3636 x4528), email: James.Moore@afit.edu.

SPONSOR FUNDED RESEARCH PROJECTS

“JDPAC and AFIT Distribution Research Proposal (LOC).” Sponsor: USTRANSCOM. Funding: \$500,000. [COA]

REFEREED JOURNAL PUBLICATIONS

Roesener, A.G., J.W. Barnes, J.T. Moore, and D. Van Veldhuizen, “An Advanced Tabu Search Approach to the Static Airlift Loading Problem,” *Military Operations Research* 15 (1): 5-29 (2010). [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Nance, R.L., A.G. Roesener and J.T. Moore, "An Advanced Tabu Search for Solving the Mixed Payload Airlift Loading Problem", Institute for Operations Research and Management Science International Meeting, Buenos Aires, Argentina, 6-9 June 10. [COA]

Goodrich, Preston, A. G. Roesener, and James Moore, “Delivery Time Variance Reduction in the Military Supply Chain,” Military Operations Research Society Symposium, Quantico, VA, 22-24 June 2010. [COA]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Editorial Board, Military Operations Research.

Editorial Board, International Journal of Operational Research.

Program Director, Operations Research Master’s Program, Department of Operational Sciences.

AFIT Graduate School Promotion and Tenure Committee member.

Geyer, A.J., Hall, S.N., and Moore, J.T., 2009, “Operations-focused Optimized Theater Weather Sensing Strategies Using Preemptive Binary Integer Programming,” The McNaughton Sessions, Royal Military College, Kingston, Ontario, Canada. [COA]

OGDEN, JEFFERY A.,

Associate Professor of Logistics and Supply Chain 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.

REFEREED JOURNAL PUBLICATIONS

Vance, A., Lowry, P.B., and Ogden, J.A. (2010) "Testing the Potential of RFID to Increase Supply-Chain Agility and to Mitigate the Bullwhip Effect," *International Journal of Applied Logistics*, Vol. 1, No. 1, 48-66. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Ford, T.C., Ogden, J.A., and Johnson, A.W. (2010) "A Method for Measuring Supply Chain Interoperability," published as a full paper and presented at the Industrial Engineering Research Conference, Cancun, Mexico, June 2010. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Ogden, J.A., Gardner, C.P., and Brady S. (2010) "Balancing Government Risks with Contractor Incentives in Performance-Based Logistics Contracts," published as a full paper and presented at the 20th Annual North American Research/Teaching Symposium on Purchasing and Supply Chain Management, Tempe, Arizona, March 2010. [COA]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Session chair for the ISM's 2010 North American Research and Teaching Symposium.

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.

Reviewed for the Supply Chain Forum: An International Journal.

Reviewed papers for the 2010 Industrial Engineering Research Conference.

Reviewed papers for ISM's 2010 North American Research and Teaching Symposium.

Presented "Balancing Government Risks with Contractor Incentives in Performance-Based Logistics Contracts" at the North American Research and Teaching Symposium on Purchasing and Supply Management, Tempe, AZ. [COA]

International Society of Logistics Awards Committee member.

AFIT Survey Control Board Member.

AFIT Graduate School Curriculum Degree Requirements Committee (CDRC) member.

PETTIT, TIMOTHY J., Lt Col,

Assistant Professor of Logistics and Supply Chain Management, Department of Operational Sciences AFIT Appointment Date: 2008 (AFIT/ENS); Deputy Department Head; 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.

SPONSOR FUNDED RESEARCH PROJECTS

"Research, Analysis and Transition Support to the Director of Logistics and Sustainment." Sponsor: HQ AFMC. Funding: \$350,000. [COA]

"Research, Analysis and Transition Support to the 478th Aeronautical Systems Group." Sponsor: AFMC. Funding: \$570,035. [COA]

REFEREED JOURNAL PUBLICATIONS

Timothy J. Pettit, Joseph Fiksel and Keely L. Croxton, "Ensuring Supply Chain Resilience: Development of a Conceptual Framework," *Journal of Business Logistics*, Spring 2010, Vol. 31, No. 1, pp. 1-21. [COA]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Selected as member of the Education Strategies Committee, the academic governance board of the field's premier professional organization, the Council for Supply Chain Management Professionals. The committee executes the annual Educators Conference, Doctoral Symposium, Internships and Academic Awards.

Co-Coordinator, Logistics class presentation: Simulated terrorism scenario to the Great Lakes Hazards Coalition, a newly formed public and private consortium from 7 states (NY, PA, OH, IN, IL WI and MN).

ROBBINS, MATTHEW J., Maj,

Assistant Professor of Operations Research, Department of Operational Sciences, AFIT Appointment Date: 2010 (AFIT/ENS); Deputy Director, Center for Operational Analysis; BS, Computer Systems Engineering, University of Arkansas, 1999; MS, Operations Research, Air Force Institute of Technology, 2005; PhD, Industrial Engineering, University of Illinois at Urbana-Champaign, 2010. Maj Robbins' research interests include modeling and simulation with a specific focus in stability and reconstruction operations, decision analysis, and healthcare management science. Tel. 937-255-3636 x4539 (DSN 785-3636 x4539), email Matthew.Robbins@afit.edu.

ROESENER, AUGUST G., Maj,

Assistant Professor of Operations Research, Department of Operational Sciences, AFIT Appointment Date: 2006 (AFIT/ENS); Deputy Director, Center for Operational Analysis (COA); BS, United States Air Force Academy, 1998; MS, The University of Florida, 2002; PhD, The University of Texas at Austin, 2006. Major Roesener's research interests include linear and integer optimization, heuristics search algorithms, and experimental design. As of August 2010, Major Roesener is serving as a student at the Air Command and Staff College, Maxwell Air Force Base, Alabama.

REFEREED JOURNAL PUBLICATIONS

Roesener, A. G., J. W. Barnes, J. T. Moore, D. A. Van Veldhuizen. 2010. An Advanced Tabu Search Approach to the Static Airlift Loading Problem. *Military Operations Research Journal*: 15:1, 5 – 29 (2010). [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Roesener, A.G., S.N. Hall and Y.G. Ozen. "An Integer Programming Formulation for a Single Pallet in the Airlift Loading Problem with Insufficient Aircraft." World Congress in Computer Science, Computer Engineering and Applied Computing, Las Vegas, NV, July 12-15, 2010. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Hall, S.N., A.G. Roesener and Y.G. Ozen. "A Hybrid Genetic Algorithm Approach to the Airlift Loading Problem with Insufficient Aircraft." Institute for Operations Research and Management Science International Meeting, Buenos Aires, Argentina, June 6-9, 2010. [COA]

Nance, R.L., A.G. Roesener and J.T. Moore. "An Advanced Tabu Search for Solving the Mixed Payload Airlift Loading Problem." Institute for Operations Research and Management Science International Meeting, Buenos Aires, Argentina, June 6-9, 2010.

Molina, C., Johnson, A., and Roesener, A., "Reusable Launch Vehicle Design Implications for Regeneration Time." Proceedings of the American Institute of Aeronautics and Astronautics Space 2009 Conference, Pasadena CA, AIAA-2009-6471. [COA]

Goodrich, P., J.T. Moore, and A.G. Roesener. "Variance Reduction in the Military Supply Chain." Military Operations Research Society Symposium, Quantico, VA, June 22-24, 2010. [COA]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Department of Operational Sciences Faculty of the Quarter, Spring 2010 (student nominated award.)

INFORMS National Meeting, October 11-13 2009, San Diego, CA (C. Molina, A. Johnson, and A. Roesener), "Reusable Launch Vehicle Design Implications." [COA]

Military Deployment, US Central Command, July 21, 2009 – November 21, 2009.

SANDLIN, DORAL E., Lt Col,

Assistant Professor of Logistics and Supply Chain Management, Department of operational Sciences, AFIT Appointment Date: 2010 (AFIT/ENS); Chief, Logistics Division; BS, Civil Engineering, US Air Force Academy, 1992; MBA, Business, Rutgers University, 2004; MLM, Logistics and Supply Chain Management, Air Force Institute of Technology, 2006; MA, Logistics Management, The Ohio State University, 2009; PhD, Logistics, The Ohio State University, 2010. Lt Col Sandlin's research interests include transportation selection models, cross-functional integration, and logistics strategy. Tel. 937-255-3636 X4533 (DSN 785-3636 X4533), email: Doral.Sandlin@afit.edu.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Sandlin, Doral (2009), "Transportation Selection Models," Annual SOLE Conference, Dallas, TX, 2009. [COA]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Program Director, Logistics (Air Mobility) Master's Program, Department of Operational Sciences.

Co-Coordinator, Logistics class presentation: Simulated terrorism scenario to the Great Lakes Hazards Coalition, a newly formed public and private consortium from 7 states (NY, PA, OH, IN, IL, WI and MN).

SKIPPER, JOSEPH B., Maj,

Assistant Professor of Logistics and Supply Chain Management, Department of Operational Sciences, AFIT
Appointment Date: 2008 (AFIT/ENS): Deputy Director, Center for Operational Analysis (COA); 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: Joseph.Skipper@afit.edu.

SPONSOR FUNDED RESEARCH PROJECTS

"Leading Edge Supply Chain: Identifying Ways to Improve Weapon Systems Sustainment & Logistics Support." Sponsor: AFRL/RX. Funding: \$410,000. [COA]

REFEREED JOURNAL PUBLICATIONS

Skipper, Joseph B., Joe B. Hanna, and Brian J. Gibson (2010), "Alabama Power Response to Katrina: Managing a Severe Service Supply Chain Disruption," *Journal of the International Academy for Case Studies*, Vol. 16, No. 2, pp. 15-22. [COA]

Hanna, Joe B., Dianne J. Hall, and Joseph B. Skipper (2010), "Mitigating Supply Chain Disruption: The Importance of Top Management Support to Collaboration and Flexibility," *International Journal of Logistics Systems Management*, Vol. 6, No. 4, pp. 397-414. [COA]

Skipper, Joseph B., Joe B. Hanna, and Brian J. Gibson (2010), "Alabama Power Response to Katrina: Managing a Severe Service Supply Chain Disruption," *Journal of the International Academy for Case Studies*, Vol. 16, No. 1, pp. 21-31. [COA]

Skipper, Joseph B. and Joe B. Hanna (2009), "Minimizing Supply Chain Disruption Risk through Enhanced Flexibility," *International Journal of Physical Distribution and Logistics Management*, Vol. 39, No. 5, pp. 404-427. IJPDLM 2010 Best Paper Award. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Bell, John E., Joseph B. Skipper, William A. Cunningham, Daniel D. Mattioda, and Krista LaPietra (April 6-9 2010), "Location Consolidation of Military Equipment for Deployment," Proceedings of the 2010 Western Decision Science Institute Annual Meeting, Lake Tahoe, NV. [COA]

Mattioda, Daniel, Samir Barman, Warren Fisher, and Joseph B. Skipper (2009), "Controlled Release Location of Jobs in a Hybrid Job/Flow Shop Environment," The Huntsville Simulation Conference, Huntsville, AL. [COA]

Hall, Dianne, Joseph B. Skipper, Heath Landrum, and Joe B. Hanna, (2009), "The Moderating Effect of Information Technology on the Relationship between Comprehensive Planning Processes and Flexible Responsiveness," 15th Americas Conference on Information Systems, Toronto, Ontario, Canada. [COA]

Hall, Dianne, Joseph B. Skipper, Joe B. Hanna, and Joseph Huscroft (2009), "Reducing Uncertainty and Equivocality in the Supply Chain," Production and Operations Management Society National Conference, Orlando, FL. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Brady, Stephen, Joseph Skipper, William Cunningham, "An Optimization of the Hub-and-spoke Distribution Network in United States European Command," 2009 INFORMS Annual Meeting, San Diego, CA, Nov 2009. [COA]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Program Director, Master of Science in Logistics Program, Department of Operations Sciences.

Session Chair, Western Decision Sciences Institute, Military Applications.

Reviewer, Council of Supply Chain Management Professional Educators Conference.

Logistics and Supply Chain Management Symposium Chair.

AFIT Graduate School Awards Committee Member.

AFIT Representative to AFRL Intuition Review Board (IRB) Committee.

Co-Coordinator, Logistics class presentation: Simulated terrorism scenario to the Great Lakes Hazards Coalition, a newly formed public and private consortium from 7 states (NY, PA, OH, IN, IL WI and MN).

Deployed as Director of Operations, 332 Expeditionary Logistics Readiness Squadron, Joint Base Balad, Iraq. Largest USAF deployed LRS.

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. Tel. 937-255-3636 x7106 (DSN 785-3636 x7106), email: Marlin.Thomas@afit.edu.

REFEREED JOURNAL PUBLICATIONS

Thomas, M.U., "Models for managing contingency construction operations," Journal of Construction Engineering & Management, Vol. 136/No. 3, 2010, pp. 391- 398.

Pan, Y., Thomas, M.U., "Repair and replacement decisions for warranted products under Markov deterioration," IEEE Transactions on Reliability, Vol. 59, No. 2, 2010, pp. 368-373.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Thomas, Marlin and Adedeji Badiru, "Utilization of Industrial Engineers in the Air Force," Air Force Air Education and Training Command (AETC) Symposium, San Antonio, TX, Jan 14-15, 2010.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

“Customer Cost-variability Sensitivity in Warranty and Maintenance Planning Decisions,” Edward P. Fitts
Department of Industrial and Systems Engineering, North Carolina State University, March 11, 2010.

WEIR, JEFFERY D.,

Associate Professor of Operations Research, AFIT Appointment Dates: 2002-2008, 2009 (AFIT/ENS);
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.

SPONSOR FUNDED RESEARCH PROJECTS

“Center for Operational Analysis (COA) Support.” Sponsor: JFCC. Funding: \$200,000. [COA]

“Research, Analysis and Transitional Support to the United States Strategic Command Joint Force
Component Command for Intelligence, Surveillance and Reconnaissance (JFCC-ISR).” Sponsor: DIA.
Funding: \$121,840. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Thal, A., Weir, J. D., and Mayer, G., "Strategic R&D Project Selection Using Decision Analysis", Industrial
Engineers Research Conference Jun 2010, Cancun Mexico. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Jeong, G., Hall, S. and Weir, J.D., "A Multi-Objective Approach to a Bipartite Assignment Matching
Problem Using Weighted Values from Multiple Constraints,” 78th Military Operations Research Society
Symposium 2010. [COA]

Gutman A., and Weir, J.D., "Triage Method: A Multiobjective Decision Analysis (MODA) Technique for
Continuous Decision Support,” 78th Military Operations Research Society Symposium 2010. [COA]

Gutman A., and Weir, J.D., "The Random Sampling of Vectors in a Bounded Region via Monte Carlo
Simulation,” 78th Military Operations Research Society Symposium 2010. [COA]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Program Director, Master of Science in Operational Analysis Program, Department of Operations Sciences.
Sanders, M., Gutman, A. and Weir, J.D., "Risk Profiles and Rank Sensitivity in the Selection of a Course of
Action in Stability Operations", INFORMS Annual Meeting Nov 2009, Invited speaker, Joint Session,
Decision Analysis Society and Military Applications Society. [COA]

Systems Engineering Track Chair, Industrial Engineering Research Conference (IERC) 2010.

Reviewer, Journal of the Military Operations Research Society.

Reviewer, Computer Methods and Programs in Biomedicine.

Reviewer, Wiley Encyclopedia of Operations Research and Management Science.

Reviewer, Industrial Engineering Research Conference IERC Proceedings.

Currently supporting JFCC-ISR STRATCOM on Vice Chairman Joint Chiefs of Staff (VCJCS) tasker to develop a methodology to determine Intelligence, Surveillance and Reconnaissance force sizes based on Defense Planning Scenarios to be used for both acquisition decisions and operational commands. Have completed two reports, both out-briefed to the VCJCS.

5.6. DEPARTMENT OF SYSTEMS AND ENGINEERING MANAGEMENT

Access Phone: 937-255-2998, DSN 785-2998

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5.6.1	<u>DOCTORAL DISSERTATIONS</u>	190
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5.6.1. DOCTORAL DISSERTATIONS

HARDMAN, NICHOLAS S., *An Empirical Methodology for Engineering Human Subjects Integration*. AFIT/DS/ENV/09-D01. Faculty Advisor: Dr. John M. Colombi. Sponsor: 711 HPW/RH.

STRYKER, AMIE C., *Development of Measures to Assess Product Modularity and Reconfigurability*. AFIT/DS/ENV/10-M01. Faculty Advisor: Dr. David R. Jacques. Sponsor: ORSO.

YAMAMOTO, DIRK P., *Providing a Theoretical Basis for Nanotoxicity Risk Analysis Departing from Traditional Physiologically-Based Pharmacokinetic (PBPK) Modeling*. AFIT/DS/ENV/10-S01. Faculty Advisor: Dr. Michael L. Shelley. Sponsor: N/A.

5.6.2. MASTER'S THESES

ARCHAMBAULT-MILINER, RYAN R., *An Evaluation of Compressed Work Schedules and Their Impact on Electricity Use*. AFIT/GCA/ENV/10-M01. Faculty Advisor: Lt Col Eric J. Unger. Sponsor: HQ AFMC.

BARKER, DANIEL A., *Validation of a Concept Assessment Framework*. AFIT/GRD/ENV/10M-01. Faculty Advisor: Dr. David R. Jacques. Sponsor: N/A.

BECK, MATTHEW C., *Downside Risk Optimization of the Thrift Savings Plan Lifecycle Fund Portfolios*. AFIT/GCA/ENV/10-M02. Faculty Advisor: Lt Col R. David Fass. Sponsor: SAF.

BUGAJSKI, GABRIEL T., *Architectural Considerations for Single Operator Management of Multiple Unmanned Aerial Vehicles*. AFIT/GSE/ENV/10-M03. Faculty Advisor: Dr. John M. Colombi. Sponsor: AFRL/RB.

COBB, CHRISTOPHER J. and GALLEGOS, DAMIAN J., *An Analysis of the Efficacy and Effectiveness of Live-Virtual-Constructive Capabilities in the Joint Environment for Testing and Training*. AFIT/GSE/ENV/10-J01DL. Faculty Advisor: Dr. John M. Colombi. Sponsor: N/A.

COLON, CARLOS J., *Assessing the Economic and Environmental Impacts Associated with Current Street Lighting Technologies*. AFIT/GEM/ENV/10-M01. Faculty Advisor: Dr. Alfred E. Thal. Sponsor: N/A.

COOPER, CASEY W., *High Volume Air Sampling for Viral Aerosols: A Comparative Approach*. AFIT/GES/ENV/10-M01. Faculty Advisor: Maj Jeremy M. Slagley. Sponsor: USAFSAM.

CSOMA, ERNEST, *Defining the Technology Transition Manager within the Acquisition Framework of the Department of Defense*. AFIT/GRD/ENV/10-M02. Faculty Advisor: Dr. Alfred E. Thal. Sponsor: N/A.

DAVIS, LEVI N., *Personality Measures as Predictors of Long-Term Employment in Air Force Officers*. AFIT/GEM/ENV/10-M02. Faculty Advisor: Lt Col Daniel T. Holt. Sponsor: N/A.

DILLON, DOUGLAS R. and STYERS, ENRIQUETA M., *Analyzing Systems Integration Best Practices and Assessment in DOD Space Systems Acquisition*. AFIT/GSE/ENV/09-02DL. Faculty Advisor: Dr. John M. Colombi. Sponsor: AFSPC/SMC.

EASTON, RYAN M., *Using the "Compatibility Assessment Method" to Determine Subsystem Feasibility on Predator UAS*. AFIT/GRD/ENV/10-J01. Faculty Advisor: Lt Col David S. Long. Sponsor: N/A.

ELTON, BENJAMIN O., *Mechanical Properties Characterization and Business Case Analysis of the Fiber Metal Laminate GLARE-3 for Use as Secondary Aircraft Structure*. AFIT/GRD/ENV/10M-05. Faculty Advisor: Dr. Alfred E. Thal. Sponsor: N/A.

FERRERI, MATTHEW R., *Particulate Characterization and Control Evaluation for Carbon Fiber Composite Aircraft Crash Recovery Operations*. AFIT/GIH/ENV/10-M01. Faculty Advisor: Maj Jeremy M. Slagley. Sponsor: AFRL/RX.

FRY, FREDERICK G., *Optimizing Aircraft Availability: Where to Spend Your Next O&M Dollar*. AFIT/GCA/ENV/10-M03. Faculty Advisor: Lt Col Eric J. Unger. Sponsor: HQ AFMC/A4.

GALLEGOS, DAMIAN J., See COBB, CHRISTOPHER J.

GEORGE, ANTHONY R., *Evaluation of Cost Improvement Models When Programs Experience Unplanned Production Decreases*. AFIT/GCA/ENV/10-M04. Faculty Advisor: Lt Col Eric J. Unger. Sponsor: HQ USAF/A9.

GEORGE, DEREK R., *Evaluation of Alternative Technologies to Supply Drinking Water to Marines in Forward Deployed Locations*. AFIT/GES/ENV/10-M02. Faculty Advisor: Dr. Mark N. Goltz. Sponsor: MCES/UI.

GHEESLING, RUSSELL H., *A Study of Formal and Informal Mentoring in the United States Air Force*. AFIT/GEM/ENV/10-M03. Faculty Advisor: Dr. Daniel T. Holt. Sponsor: N/A.

GILLILAND, AMY L., *The Cost of Treating Posttraumatic Stress Disorder and Mild Traumatic Brain Injuries*. AFIT/GFA/ENV/10-M01. Faculty Advisor: Maj Jeremy M. Slagley. Sponsor: 711 HPW/RH.

GRADDY, MARCHELLO T., *Using Decision Analysis To Select Facility Maintenance Management Information Systems*. AFIT/GEM/ENV/10M-04. Faculty Advisor: Dr. Alfred E. Thal. Sponsor: N/A.

GRAESSLE, MARC J., *Evaluation of Hazardous Airborne Particulate and Gaseous Exposure to Flight Crew Members During the Firing of the 25mm, 40mm and 105mm Weapons in the AC-130U Gunship*. AFIT/GIH/ENV/10-M02. Faculty Advisor: Maj Jeremy M. Slagley. Sponsor: AFSOC.

GRIGSBY, DAVID A., *Satellite Capabilities Mapping-Utilizing Small Satellites*. AFIT/GSE/ENV/10-S01DL. Faculty Advisor: Dr. Jonathan A. Black. Sponsor: N/A.

HALE, BRIAN L., *Mission Assurance: A Review of Continuity of Operations Guidance for Application to Cyber Incident Mission Impact Assessment (CIMIA)*. AFIT/GIR/ENV/10-J01. Faculty Advisor: Dr. Michael Grimaila. Sponsor: 711 HPW/RH.

HOGAN, MICHAEL S. and PESCATORE, MELISSA L., *Timely Implementation of a Tasking, Processing, Exploitation, and Dissemination Ground Architecture in an Operationally Responsive Space Environment*. AFIT/GSE/ENV/10-J03DL. Faculty Advisor: Dr. Bradley J. Ayres. Sponsor: N/A.

HORENZIAK, MICHAEL W., *Low Dose Sarin Leads To Murine Cardiac Dysfunction*. AFIT/GIH/ENV/10-M03. Faculty Advisor: Lt Col David A. Smith. Sponsor: Wright State University Boonshoft School of Medicine.

HUGHES, ROBINSON C.L., *Development of a Concept Maturity Assessment Framework*. AFIT/GRD/ENV/10-M05. Faculty Advisor: Dr. David R. Jacques. Sponsor: N/A.

JEE, SOO-CHAN, *Development of Morphing Aircraft Using SMP*. AFIT/GSE/ENV/10-M02. Faculty Advisor: Dr. Som Soni. Sponsor: N/A.

JOHNSTON, ROSS T., *Understanding the Effectiveness of Performance Management Practices*. AFIT/GRD/ENV/10-M07. Faculty Advisor: Lt Col Joseph R. Wirthlin. Sponsor: N/A.

KARCHER, KENNETH M., *Optimization of Environmental Conditions to Maximize Carbon Dioxide Sequestration Through Algal Growth*. AFIT/GES/ENV/10-M03. Faculty Advisor: Dr. Charles A. Bleckmann. Sponsor: AFRL/RX & University of Dayton Research Institute.

KINSEL, WAYNE C., *Environmental Life Cycle Assessment of Coal-Biomass to Liquid Jet Fuel Compared to Petroleum-Derived JP-8 Jet Fuel*. AFIT/GEM/ENV/10-M05. Faculty Advisor: Dr. Charles A. Bleckmann. Sponsor: AFRL/RZ.

LANCASTER, KRISTEN M., *Use of Negation in Search*. AFIT/GCO/ENV/10-J01. Faculty Advisor: Lt Col Jason M. Turner. Sponsor: USAARL.

LANGENBRUNNER, AMANDA J. and TRAUTWEIN MARY R., *Extending the Strategy Based Risk Model Using the Delphi Method: An Application to the Validation Process for Research and Development Satellites*. AFIT/GSE/ENV/09-03DL. Faculty Advisor: Dr. John M. Colombi. Sponsor: SDTW/SDSG.

LeBLANC, RYAN L., *The Effects of Opinion Leaders and Change Messages on Organization Member Change Attitudes: A Field Experiment*. AFIT/GEM/ENV/10-M6. Faculty Advisor: Dr. Daniel T. Holt. Sponsor: HQ AMC/A7.

LEMKE, AARON M., *Part Count: Monolithic Part Effects On Manufacturing Labor Cost, An Aircraft Applied Model*. AFIT/GFA/ENV/10-M02. Faculty Advisor: Dr. Som Soni. Sponsor: AFRL/RB.

McCARTY, JUDSON E., *A Simulink Based Tool for Design Reference Mission Modeling*. AFIT/GSE/ENV/10-S02DL. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: N/A.

MERSKI, NICHOLAS J., *Tailored Systems Architecture for Design of Space Science and Technology Missions Using DODAF V2.0*. AFIT/GSE/ENV/09-04DL. Faculty Advisor: Dr. John M. Colombi. Sponsor: AFSPC/SMC.

MUNFAKH, ANTOINE N., *Method of Measuring The Economic Impact of a Radiological Dispersal Event within an Urban Environment*. AFIT/GFA/ENV/10-M03. Faculty Advisor: Lt Col David A. Smith. Sponsor: 711 HPW/RH.

MYERS, JUSTIN M., *A Dynamically Configurable Log-based Distributed Security Event Detection Methodology using Simple Event Correlator*. AFIT/GCO/ENV/10-J02. Faculty Advisor: Dr. Michael R. Grimaila. Sponsor: NSA.

NAGY, KRISTOPHER C., *An Analysis of the Elements of Collaboration Associated with Top Collaborative Tools*. AFIT/GIR/ENV/10-M01. Faculty Advisor: Lt Col Jason M. Turner. Sponsor: N/A.

OYAMA, KYLE F., *A Structured Analysis to Link Modularity to System Assembly and Checkout*. AFIT/GRD/ENV/10-M09. Faculty Advisor: Dr. David R. Jacques. Sponsor: N/A.

PAULSON, ANTHONY B., *Generational Differences in Knowledge Markets*. AFIT/GRD/ENV/10-M10. Faculty Advisor: Lt Col Jason M. Turner. Sponsor: N/A.

PESCATORE, MELISSA L., See HOGAN, MICHAEL S.

PLATT, SETH D., *The Development of a Leadership Self-Efficacy Measure*. AFIT/GEM/ENV/10-M07. Faculty Advisor: Lt Col Alexander J. Barelka. Sponsor: N/A.

POULTON, JOSHUA M., *A Study of the Relationship Between Proenvironmental Product Use and Environmental Concern*. AFIT/GEM/ENV/10-M09. Faculty Advisor: Dr. Alfred E. Thal. Sponsor: N/A.

RIDDEL, KEVIN C., *An Analysis of Factors that Influence Air Force Civil Engineer Company Grade Officer Turnover Intentions*. AFIT/GEM/ENV/10-M10. Faculty Advisor: Dr. Daniel T. Holt. Sponsor: HQ USAF/A7C.

ROWLEY, WILLIAM M., *Nitrogen and Phosphorus Biomass-Kinetic Model for Chlorella vulgaris in a Biofuel Production Scheme*. AFIT/GES/ENV/10-M04. Faculty Advisor: Dr. Charles A. Bleckmann. Sponsor: University of Dayton Research Institute.

SABATOWSKI, PETER A., *Security Vulnerability Trends Related to Electric Power Supplied at Military Installations*. AFIT/GEM/ENV/10-M11. Faculty Advisor: Dr. Alfred E. Thal. Sponsor: N/A.

SCANLAN, JOHN H., IV., *Assessing the Alignment of Information Security with Strategic Business, and Strategic Information System Planning: A Department of Defense Perspective*. AFIT/GIR/ENV/10-J02. Faculty Advisor: Dr. Michael R. Grimaia. Sponsor: N/A.

SEIBERT, MATTHEW T., STRYKER, ANDREW J., WARD, JILL R., and WELLBAUM, CHRIS T., *System Analysis and Prototyping For Single Operator Management of Multiple Unmanned Aerial Vehicles Operating Beyond Line of Sight*. AFIT/GSE/ENV/10-M01. Faculty Advisor: Dr. David R. Jacques. Sponsor: AFRL/RB.

SPANBAUER, BRIAN W. and YATES, JESSE M., *Geostationary Orbit Development and Evaluation for Space Situational Awareness*. AFIT/GSE/ENV/09-05DL. Faculty Advisor: Dr. Jonathan T. Black. Sponsor: N/A.

STRANGE, RUSSEL A., *Economic Feasibility Of Installing An Anaerobic Digester On A Department Of Defense Installation*. AFIT/GES/ENV/10-M05. Faculty Advisor: Lt Col David A. Smith. Sponsor: Commandant of the Marine Corps.

STRYKER, ANDREW J., See SIEBERT, MATTHEW T.

STUBBS, JOHN E., *Development of a Novel Noise Delivery System for JP-8 Ototoxicity Studies*. AFIT/GIH/ENV/10-M04. Faculty Advisor: Maj Jeremy M. Slagley. Sponsor: NHRC/EH.

STYERS, ENRIQUETA M., See DILLON, DOUGLAS R.

THURRELL, REBECCA, *The Development of a Tactical-Level Full Range Leadership Measurement Instrument*. AFIT/GEM/ENV/10-M12. Faculty Advisor: Lt Col Alexander J. Barelka. Sponsor: N/A.

TOPHAM, JASON E., *Satellite Ground Systems Interoperability Measurement and Analysis*. AFIT/GSE/ENV/09-01DL. Faculty Advisor: Dr. David R. Jacques. Sponsor: SDTW/SDS.

TRAUTWEIN, MARY R., See LANGENBRUNNER, AMANDA J.

VUONG, KHAI H., *Modeling the Fate of Groundwater Contaminants Resulting from Leakage of Butanol-blended Fuel*. AFIT/GES/ENV/10-M06. Faculty Advisor: Dr. Mark N. Goltz. Sponsor: AFCET/TD.

WARD, GREGORY J., *Knowledge Transformation in the United States Air Force Civil Engineer Career Field: A System Dynamics Approach*. AFIT/GEM/ENV/10-M13. Faculty Advisor: Dr. Michael L. Shelley. Sponsor: N/A.

WARD, JILL R., See SIEBERT, MATTHEW T.

WELLBAUM, CHRIS T., See SIEBERT, MATTHEW T.

WOJTOWICZ, JOHN A., *Process for Concept Assessment and Maturation*. AFIT/GSE/ENV/10-J01DL. Faculty Advisor: Dr. David R. Jacques. Sponsor: N/A.

WYMAN, DANA C., *Best Practices In Government Acquisition: A Test Of The Government Accountability Office's Knowledge-Based Acquisition Theory*. AFIT/GCA/ENV/10-M05. Faculty Advisor: Lt Col R. David Fass. Sponsor: AEDC/FM.

YATES, JESSE M., See SPANBAUER, BRIAN W.

5.6.3. GRADUATE RESEARCH PAPERS

DAVIS, MICHAEL N. and KABBAN, REGINALD W., *Developing Metrics for Evaluating Competing Layered Sensing Architectures*. AFIT/ISE/ENV/10-J01. Faculty Advisor: Dr. David R. Jacques. Sponsor: AFRL/RV.

DROWN, DARON J. and GRAHAM, SETH W., *Core Logistics Capability Policy Applied to USAF Combat Aircraft Avionics Software: A Systems Engineering Analysis*. AFIT/ISE/ENV/10-J02. Faculty Advisor: Col David S. Long. Sponsor: 478 AESG/EN.

EVANS, MICKEY R., *An Informational Analysis and Communications Squadron Survey of Cyberspace Mission Assurance*. AFIT/IDE/ENV/10-J01. Faculty Advisor: Dr. Michael R. Grimaila. Sponsor: 711 HPW/RH.

GLEN, MATTHEW G. and IVENER, TODD A., *An Engineering Baseline Evaluation and Service-Oriented Analysis of Air Mission Management Application Alternatives*. AFIT/ISE/ENV/10-J03. Faculty Advisor: Dr. John M. Colombi. Sponsor: 350 ELSG/CC.

GRAHAM, SETH W., See DROWN, DARON J.

IVENER, TODD A., See GLEN, MATTHEW G.

KABBAN, REGINALD W., See DAVIS, MICHAEL N.

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

REFEREED JOURNAL PUBLICATIONS

Badiru, Adedeji B., "Half-life of Learning Curves for Information Technology Project Management," *International Journal of IT Project Management*, 1(3), Sept 2010, pp. 28-45.

Badiru, Adedeji B., Jeremy M. Slagley, and David A. Smith, "Project Management Application for Engineering Program Accreditation Preparation," *Journal of Professional Issues in Engineering Education & Practice*, Vol 136, No. 1, Jan 2010, pp. 39-47.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Thomas, Marlin and Adedeji Badiru, "Utilization of Industrial Engineers in the Air Force," Air Force Air Education and Training Command (AETC) Symposium, San Antonio, TX, Jan 14-15, 2010.

BOOKS AND CHAPTERS IN BOOKS

Badiru, Adedeji B. and Omitaomu, O. A., *Handbook of Industrial Engineering Equations, Formulas and Calculations*, Taylor & Francis CRC Press, Boca Raton, FL, 2010.

Badiru, Deji, *Physics of Soccer: Using Math and Science to Better Your Game*, iUniverse, Bloomington, Indiana, USA, 2010.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Badiru, Adedeji B., "Soccer Ball Path Optimization," *OR/MS Today*, April 2010, p. 57.

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

SPONSOR FUNDED RESEARCH PROJECTS

"Individual and Team Level IT Suspicion." Sponsor: AFOSR. Funding: \$34,419.

SPONSOR FUNDED EDUCATIONAL PROJECTS

"Squadron Officer College Blended Learning Study." Sponsor: AETC. Funding: \$400,000.

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

REFEREED JOURNAL PUBLICATIONS

Brown, L.M., J.P. McComb, M.D. Vangsness, L.L. Bowen, S.S. Mueller, L.M. Balster, C.A. Bleckmann.
2010. Community dynamics and phylogenetics of bacteria fouling Jet A and JP-8 aviation fuel.
International Biodeterioration & Biodegradation. 64:253-261.

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 2009.

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

SPONSOR FUNDED RESEARCH PROJECTS

"TBMCS Architectural Analysis." Sponsor: 350 ELSG. Funding: \$75,000.

REFEREED JOURNAL PUBLICATIONS

Nicholas Hardman, John Colombi, David Jacques, Raymond R. Hill, and Janet Miller, An Empirical Function
Allocation Method and its Application to Traffic Collision Avoidance, *International Journal of Applied
Aviation Studies*, Vol. 9, No. 2, pp. 133-153, 2009.

J. Colombi and R. Cobb, Application of Systems Engineering to Rapid Prototyping for Close Air Support.
Defense Acquisition Review Journal, Vol. 16, No. 3, pp. 284-303. Oct 2009.

Matt Larkowski, Robert F. Mills and John M. Colombi, The Cyberspace-Development Dogfight: Tightening
The Acquisitions Turn Circle, *High Frontier Journal* 6(1), US Air Force Space Command, pp. 44-48, Nov
2009.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Vinod Naga, John Colombi, Ken Hopkinson and Michael Grimaila, Mission-Related Execution and Planning
Through Quality of Service Methods, *Annual International Command and Control Research and
Technology Symposium (ICCRST)*, June 2010 (Best Student Paper).

Vinod Naga, John Colombi, Michael Grimaila, Kenneth Hopkinson, Enabling Performance of Mission-
Oriented Networks Through Quality of Service Methods, *WorldComp 2010 – International Conference on
Security and Management: Special Track on Mission Assurance*, July 21-25, 2010 - Las Vegas, NV.

Jill Ward and John Colombi, Human Systems Integration: A Discrete Event Simulation of Operational Utility for Control of Multiple Small Unmanned Aerial Systems. Human Factors and Ergonomics Society (HFES), 2010 Annual Meeting.

John Colombi and Jill Ward, Human Systems Analysis for Control of Multiple Small Unmanned Aerial Systems. Proceedings of the Conference on Systems Engineering Research, Hoboken, NJ, March 2010.

John M. Colombi and Nicholas S. Hardman. RELAAy – A Tool to Examine HSI Requirements. Presentation and Proceedings of the International Council on Systems Engineering Conference, Chicago, July, 2010.

Nicholas Merski and John Colombi. Tailored System Architecture for Design of Space Science and Technology (S&T) Missions using DODAF2.0, IEEE (AIAA) Aerospace Conference, Big Sky, Montana March 6-13, 2010.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

John Colombi and David Jacques. System of Systems Challenges and Solutions: Case Study Insights, 12th Annual Systems Engineering Conference (National Defense Industrial Association), Oct 2009.

David Jacques and John Colombi, Linking Interoperability and Measures of Effectiveness: A Method for Evaluating Architectures, 12th Annual Systems Engineering Conference (National Defense Industrial Association), Oct 2009.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Nicholas Hardman, David Jacques, John Colombi, Raymond R. Hill and Janet Miller, Requirements Elicitation through Legacy Mishap Analysis, American Institute of Aeronautics and Astronautics (AIAA) Journal, March 2010.

N.S. Hardman and J.M. Colombi. A mapping from the DOD human error taxonomy codes to the domains of human systems integration (Technical Report No. AFIT/EN/TR-09-04). Wright-Patterson AFB, OH: Air Force Institute of Technology, 2009.

2010 Annual International Council on Systems Engineering Symposium. John M. Colombi and Nicholas S. Hardman Best Human Factors/ Human Systems paper.

Oct 2009 AFIT Unit Compliance Inspection (UCI) Professional Performer.

2010 Int'l Command and Control Research and Technology Symposium (ICCRTS). Vinod Naga, John Colombi, Ken Hopkinson and Michael Grimaila. Best Student Paper.

ELSHAW, J. JOHN, Lt Col,

Assistant Professor of Management; BS, Accounting, University of Akron, 1991; MBA, Regis University, 1996, PhD, Krannert School of Management, Purdue University, 2010. Lt Col Elshaw's research interests include organizational behavior, trust, leadership, human resource management, organizational causes of high-consequence errors, technology impact on individual and group behavior, social network analysis, cognition and emotions, organizational climate and culture, psychological influences on foreign audiences, cross-cultural leadership and communication, and hierarchical linear modeling. Tel. 937-255-3636 x4574 (DSN 785-3636 x4574), email: John.Elshaw@afit.edu

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Created collaboration with Purdue University to research leadership initiatives at Squadron Officer School, two projects currently underway.

Initiated collaboration as the PI on research with the Louis Stokes Cleveland VA Medical Center.

Hosted the Organizational Development Network of Miami Valley quarterly meeting at AFIT.

Reviewer for Academy of Management national conference presentations, 2010, Montréal, Canada.

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

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

"Robot Wars" (OBTC Conference, Albuquerque, NM, June 2010, Fass, R. David; Wirthlin, J. Robert).

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

"The Influence of Video Game Experience on Learning Preferences and Motivation in a Training Environment" (DSI Conference, November 2009, Thal, Alfred, Yelverton, Steve, Fass, R. David).

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

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Sitzabee, William E., Michael J. Stepaniak, and Peter P. Feng. (2010). "Mission Assurance Issues with the Federal Aviation Administration's Policy to Implement GPS Navigational System," SAM'10 - 9th International Conference on Security and Management, 12-15 July, Las Vegas, NV.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Feng, Peter P., Mark N. Goltz, Alfred E. Thal, and Derek George. (2010). "Choosing by Advantages," *The Military Engineer*, Vol. 102 (667): 73-74.

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

SPONSOR FUNDED RESEARCH PROJECTS

"Hydrogeophysical Impact of Clay-DNAPL Interactions on Storage of Chlorinated Solvents in Low Permeability Zones." Sponsor: SERDP. Funding: \$37,600.

REFEREED JOURNAL PUBLICATIONS

Huang, J., J.A. Christ, and M.N. Goltz, Analytical Solutions for Efficient Interpretation of Single-well Push-pull Tracer Tests, *Water Resour. Res.*, 46, W08538.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Vuong, K., Goltz, M.N., J. Huang, and D.M. Mackay, Modeling the Fate of Groundwater Contaminants that May Result from Leakage of Alternative Fuels, Seventh International Conference on Remediation of Chlorinated and Recalcitrant Compounds, Monterey, CA, 24-27 May 2010.

Goltz, M.N., M. Knarr, J. Huang, and G. Lamont, Multi-objective Optimization of an *In Situ* Bioremediation Technology to Treat Perchlorate-contaminated Groundwater, Western Decision Science Institute 2010 Annual Meeting, Lake Tahoe, NV, 6-9 April 2010.

Demond, A.H., D. Ayral, and M.N. Goltz, Diffusional Transport of Organic Solutes in Subsurface Clay Lenses and Layers, American Geophysical Union Fall Meeting, San Francisco, CA, 14-18 Dec 2009.

Goltz, M.N., K. Vuong, J. Huang, and D.M. Mackay, Modeling the Fate of Groundwater Contaminants that May Result from Leakage of Alternative Fuels, Partners in Environmental Technology Technical Symposium and Workshop, Washington DC, 1-3 December 2009.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Inducted as Fellow, Society of American Military Engineers.

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

REFEREED JOURNAL PUBLICATIONS

Beeker, K.R., Mills, R.F., and Grimaila, M.R., "Applying Deterrence in Cyberspace," *Information Operations Journal*, Information Operations Institute, Vol. 1, No. 4, February 2010, pp. 21-27.

Legradi, J.D., Grimaila, M.R., and Smith, D., "An Exploratory Social Network Analysis of Military and Civilian Emergency Operation Centers with a Focus on Organizational Structure," *Defense Threat Reduction Agency Journal*, Vol. 1, No. 1, January 2010.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Naga, V., Colombi, J., Grimaila, M.R., and Hopkinson, K., "Mission-Related Execution and Planning Through Quality of Service Methods," *Proceedings of the 15th International Command and Control Research and Technology Symposium*, Santa Monica, California, June 22-24, 2010.

Hale, B., Grimaila, M.R., Mills, R.F., Haas, M., and Maynard, P., "Communicating Potential Mission Impact using Shared Mission Representations," *Proceedings of the 2010 International Conference on Information Warfare and Security (ICIW 2010)*, WPAFB, OH, April 8-9, 2010.

Myers, J., Grimaila, M.R., and Mills, R.F., "Insider Threat Detection using Distributed Event Correlation of Web Server Logs," *Proceedings of the 2010 International Conference on Information Warfare and Security (ICIW 2010)*, WPAFB, OH, April 8-9, 2010.

Hellesen, D., and Grimaila, M.R., "Information Asset Value Quantification Expanded," Proceedings of the 2010 International Conference on Information Warfare and Security (ICIW 2010), WPAFB, OH, April 8-9, 2010.

Anderson, E., Choobineh, J., Fazen, M., and Grimaila, M.R., "Mission Impact: Role of Protection of Information Systems," Proceedings of the 2010 International Conference on Information Warfare and Security (ICIW 2010), WPAFB, OH, April 8-9, 2010.

McDonald, T.J., Trias, E.D., Kim, Y.C., and Grimaila, M.R., "Using Logic-Based Reduction For Adversarial Component Recovery," Proceedings of the 25th ACM Symposium on Applied Computing, Lausanne, Switzerland, March 22-26, 2010.

Kulkarni, A., Williams, E., and Grimaila, M.R., "Mitigating Security Risks for End User Computing Application (EUCA) Data," Proceedings of the IEEE International Conference on Information Privacy, Security, Risk and Trust (PASSAT2010), Minneapolis, Minnesota, August 20-22, 2010.

Abercrombie, R., Sheldon, F. and Grimaila, M.R., "A Systematic Comprehensive Computational Model for Stake Estimation in Mission Assurance," Proceedings of the IEEE International Conference on Information Privacy, Security, Risk and Trust (PASSAT2010), Minneapolis, Minnesota, August 20-22, 2010.

Dube, T., Raines, R., Peterson, G., Bauer, K., Grimaila, M.R., and Rogers, S., "Malware Type Recognition and Cyber Situational Awareness," Proceedings of the IEEE International Conference on Information Privacy, Security, Risk and Trust (PASSAT2010), Minneapolis, Minnesota, August 20-22, 2010 (Best Paper Award).

Grimaila, M.R., Anderson, E., and Choobineh, J., "Security Management Life Cycle (SMLC): A Comparative Study," Proceedings of the 16th Americas Conference on Information Systems (AMCIS 2010), Lima, Peru, August 12-15, 2010.

Grimaila, M.R., Hale, B., Mills, R.F., Haas, M., and Kelly, D., "Mission Assurance: Issues and Challenges," Proceedings of the 2010 International Conference on Security and Management (SAM10), Las Vegas, Nevada, July 12-15, 2010.

Sorrels, D.M., and Grimaila, M.R., "Towards Predictive Mission Risk Analysis to Operationalize Mission Assured Networking," Proceedings of the 2010 International Conference on Security and Management (SAM10), Las Vegas, Nevada, July 12-15, 2010.

Naga, V., Colombi, J., Grimaila, M.R., and Hopkinson, K., "Enabling Performance of Mission-Oriented Networks Through Quality of Service Methods," Proceedings of the 2010 International Conference on Security and Management (SAM10), Las Vegas, Nevada, July 12-15, 2010.

Johannes, T.W. and Grimaila, M.R., "Achieving Early Situational Awareness in Extreme Events," Proceedings of 2010 International Conference on Security and Management (SAM10), Las Vegas, Nevada, July 12-15, 2010.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Myers, J., Grimaila, M.R., and Mills, R.F., "Adding Value to Log Event Correlation Using Distributed Techniques," Proceedings of the Cyber Security and Information Intelligence Research Workshop (CSIIRW 2010), Oak Ridge National Laboratory, Oak Ridge, TN, April 21-23, 2010.

Parham, J.D., McDonald, J.T., Grimaila, M.R., and Kim, Y.C., "A Java Based Component Identification Tool for Measuring the Strength of Circuit Protections," Proceedings of the Cyber Security and Information Intelligence Research Workshop (CSIIRW 2010), Oak Ridge National Laboratory, Oak Ridge, TN, April 21-23, 2010.

Erskine, J.R., Peterson, G.L., Mullins, B.E., and Grimaila, M.R., "Developing Cyberspace Data Understanding: Using CRISP-DM for Host-based IDS Feature Mining," Proceedings of the Cyber Security and Information Intelligence Research Workshop (CSIIRW 2010), Oak Ridge National Laboratory, Oak Ridge, TN, April 21-23, 2010.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Invited Speaker at the NATO Cooperative Cyber Defence Centre of Excellence (CCDCoE) Conference on Cyber Conflict in Tallinn, Estonia, 15-18 June 2010.

Keynote Speaker at Cyber Security and Information Intelligence Research Workshop (CSIIRW 2010), "Mission Assurance: Issues and Challenges," Oak Ridge National Laboratory, Oak Ridge, TN, 21-23 April 2010.

Conference Chair for 5th International Conference on Information Warfare and Security (ICIW 2010), Wright-Patterson Air Force Base, Ohio, USA, 8-9 April 2010.

Appointed to the National Research Council (NRC) as a Research Advisor.

HASTY, BRYAN R., Lt Col,

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

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

"Collaborative Early Systems Engineering: Knowledge Management Review" for the USAF Center for Systems Engineering, June 2010.

Ad Hoc Reviewer, 44th Hawaii International Conference on System Sciences (HICSS) track on Knowledge Management (2010).

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

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Researched and co-authored a report (with Dr. Dennis Strouble, Lt Col William O'Connor, and Lt Col Joseph Wirthlin) for the Center for Systems Engineering titled, "An Investigation of Air Force Product Center Needs for Support of Collaborative Early Systems Engineering."

Researched and created a report for the Center for Systems Engineering titled, "Collaborative Early Systems Engineering: Strategic Information Management Review."

Supervised and advised 16 AFIT masters students in the undertaking of this effort.

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.

JACQUES, DAVID R.,

Associate Professor of Aerospace Engineering, Department of Systems and Engineering Management, AFIT.
Appointment Date: 1999 (AFIT/ENV); BS, Mechanical Engineering, Lehigh University, 1983; MS, Aeronautical Engineering, AFIT, 1989; PhD, Aeronautical Engineering, AFIT, 1995. Dr. Jacques' research interests include development planning, architecture based evaluation, multi-objective or constrained optimal design, and cooperative behavior and control of autonomous vehicles. Tel. 937-255-3636 x3329 (DSN 785-3636 x3329), email: David.Jacques@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

"Building Education and Workforce Capacity in Systems Engineering." Sponsor: OSD. Funding: \$600,000. [CSE]

"Quantitative Evaluation of Architectures in Support of the Layered Sensing Concept." Sponsor: AFRL/RV. Funding: \$50,000.

"Valuing Flexibility in Design." Sponsor: OSD. Funding: \$70,000.

REFEREED JOURNAL PUBLICATIONS

Hardman, N., J. Colombi, D. Jacques, R. Hill and J. Miller, "An Empirical Function Allocation Method and its Application to Traffic Collision Avoidance," International Journal of Applied Aviation Studies, 2010.

Ford T., J. Colombi, D. Jacques and S. Graham, "A General Method of Measuring Interoperability and Describing Its Impact on Operational Effectiveness," Journal of Defense Modeling and Simulation, 2010.

Jacques, D., J. Bode and M. Pachter, "Optimization of an Autonomous Weapon's Operating Characteristics," IEEE Systems Journal, Vol.3, #4, December 2009.

Jacques D. and D. Smith, "A Simplified Building Air Flow Model for Agent Concentration Prediction," Journal of Occupational and Industrial Hygiene, Volume 7, Issue 11, 2010.

Oyama, K, D. Jacques, A. Stryker and D. Long, "Linking Modularity to System Assembly: Initial Findings and Implications," Systems Research Forum, Volume 4, Issue 1, World Scientific Press, June 2010.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

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, October 11-14, 2009.

Stryker, Amie C. and David R. Jacques. "Development of a measure to assess reconfigurability of modular products," 8th Conference on Systems Engineering Research, Hoboken, NJ, March 2010.

Stryker, Amie C., David R. Jacques, and David S. Long. "A vector approach to assessing modularity," Proceedings of the 20th INCOSE International Symposium, Chicago, IL, July 2010.

Oyama, Kyle F., Amie C. Stryker, David R. Jacques, and David S. Long, "Linking modularity to system assembly - initial findings and implications," 8th Conference on Systems Engineering Research, Hoboken, NJ, March 2010.

Barker, D., R. Hughes, D. Jacques and R. Wirthlin, "Concept Assessment for a Stage Gate Process," 8th Conference on Systems Engineering Research, Hoboken, NJ, March 2010.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Led ENV effort for ABET review and re-accreditation of the SE Program.

Consulting to Peerless Technologies, Inc., in support of Department of Homeland Security SBIR. Developed building air flow model and optimal sensor placement algorithm for protection against chem/bio attack.

LADD, DARIN A., Maj

Assistant Professor of Information Resource Management, Department of Systems and Engineering Management, AFIT Appointment Date: 2010 (AFIT/ENV); BS, Humanities, United States Air Force Academy, 1996; MS, Information Resource Management, Air Force Institute of Technology, 2002; PhD, Management Information Systems, Washington State University, 2010. Maj Ladd's research interests include Strategic Decision Support, Public Entrepreneurship, Mobile Computing, and Research Methods. Tel. 937-255-3636 x3323 (DSN 785-3636 x3323), email: Darin.Ladd@afit.edu

REFEREED JOURNAL PUBLICATIONS

Ladd, D.A., Datta, A., Yu, Y., and Sarker, S. *Trends in Mobile Computing within the IS Discipline: A Ten-Year Retrospective*, Communications of the AIS, Vol. 27, Issue 17, 2010.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Ladd, D.A., Datta, A., and Sarker, S. "Trying to Outrun a Speeding Environment: Developing 'High-velocity' Strategic DSS Evaluation Criteria," Americas Conference on Information Systems, August 2010.

Ladd, D.A., "'Everyone Likes Likert': Using a Variable-Interval Slider to Collect Interval-level Individual Opinions," International Conference on Information Systems, December 2009.

Ladd, D.A., Hardin, A., and Fuller, M. "Stopping the 'How' from Driving the 'What': Advice on Avoiding Measurement Item Mis-specification," International Conference on Information Systems, December 2009.

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

SPONSOR FUNDED RESEARCH PROJECTS

"Use of Architectures in Support of Production Decisions." Sponsor: 703 AESG. Funding: \$60,000.

MILLER, MICHAEL E.,

Assistant Professor of Human Systems Integration, Department of Systems & Engineering Management, AFIT Appointment Date: 2010 (AFIT/ENV); BS, Ohio University, 1987; MS, Ohio University, 1989; PhD, Industrial and Systems Engineering, Virginia Tech, 1993. Dr. Miller's research interests include human systems integration, human factors engineering, advanced display technologies and automated system interaction. Tel. 937-255-3636 x4651 (DSN 785-3636 x4651), email: michael.miller@afit.edu

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Miller, M.E. and Basile, J.M. (2010). Luminance and Saturation Control for RGBW OLED Displays. In Proceedings of the Society for Information Display, Seattle, WA, vol., 41, pp. 269-272.

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.

PIGNATIELLO, JOSEPH J., Jr.,

Professor of Systems Engineering, Department of Systems and Engineering Management, AFIT Appointment Date: 2010 (AFIT/ENV); BS, Mathematics, University of Massachusetts, 1976; MS, Industrial and Systems Engineering, The Ohio State University, 1979; PhD, Industrial and Systems Engineering, The Ohio State University, 1982. Dr. Pignatiello's research interests include quality engineering, design and analysis of experiments, statistical process control, six sigma, robust design, reliability engineering and statistical methods for systems improvement. Tel. 977-255-3636 x4311 (DSN 785-3636 x4311), email: Joseph.Pignatiello@afit.edu

REFEREED JOURNAL PUBLICATIONS

Acosta-Mejia, César A. and Pignatiello, Joseph J., Jr., "The Design of S Charts with the k-of-k Runs Rule," Communications in Statistics – Simulation and Computation, Vol. 38, No. 8, pp. 1625-1639, 2009.

Guo, Yong, Simpson, James R. and Pignatiello, Joseph J., Jr., "Deciphering All Those Minimum Aberration Criteria for Experimental Designs," Quality Engineering, Vol. 21, No. 4, pp. 432-445, 2009.

Acosta-Mejia, César A. and Pignatiello, Joseph J., Jr., "Run Sum R Charts with Fast Initial Response," Communications in Statistics – Simulation and Computation, Vol. 39, No. 8, pp. 921-932, 2010.

Perry, Marcus B. and Pignatiello, Joseph J., Jr., "Identifying the Time of a Step Change in the Mean of Stationary Autocorrelated Processes," Journal of Applied Statistics, Vol. 37, No. 1, pp. 119-136, 2010.

Acosta-Mejia, César A. and Pignatiello, Joseph J., Jr., "Run Sum R Charts with Fast Initial Response," Communications in Statistics – Simulation and Computation, Vol. 39, No. 8, pp. 921-932, 2010.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Editorial Board, Quality Engineering.

Editorial Board, IIE Transactions.

Editorial Advisory Board, International Journal of Lean Six Sigma.

Editorial Advisory Board, International Journal of Six Sigma and Competitive Advantage.

Referee for Quality Engineering.

Referee for Quality and Reliability Engineering International.

Referee for Journal of Quality Technology.

Referee for International Journal of Lean Six Sigma.

RACZ, LEEANN, Maj,

Assistant Professor of Environmental Science and Engineering, Department of Systems and Engineering Management, AFIT Appointment Date: 2010 (AFIT/ENV); BS, Environmental Engineering, California Polytechnic State University, 1996; MS, Biological and Agricultural Engineering, University of Idaho, 2004; PhD, Civil and Environmental Engineering, University of Utah, 2010. Maj Racz specializes in wastewater treatment of pollutants of emerging concern, the effect of organic carbon sources on nitrifying mixed cultures, and environmental microbiology analyses. Tel. 937-255-3636 x4711 (DSN 785-3636 x4711), email: LeeAnn.Racz@afit.edu

REFEREED JOURNAL PUBLICATIONS

Racz, L., T. Datta, and Goel, R.K., Effect of Organic Carbon on Ammonia Oxidizing Bacteria in a Mixed Culture, *Bioresource Technology*, 101(16):6454-6460, 2010.

Racz, L., T. Datta, and Goel, R.K., Organic Carbon Effect on Nitrifying Bacteria in a Mixed Culture, *Water Science and Technology*, 61(11):2951-2956, 2010.

Racz, L., and R.K. Goel, Fate and Removal of Estrogens from Municipal Wastewater, *J Environmental Monitoring*, 12(1):58-70, 2010.

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

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

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

SPONSOR FUNDED RESEARCH PROJECTS

“Optimization of Manpower Utilizing Empirical Data for Ensuring Civil Engineering Operation's Flight at Al Udeid Air Base, Qatar.” Sponsor: HQ AFCEA. Funding: \$10,080.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER

Sabatowski, P., Thal, A., and Sitzabee, W., “Spatial Analysis of U.S. Power Outages,” Institute of Industrial Engineers National Conference, Homeland Security Focus. June 2010.

Sitzabee, W. and Stepaniak, M., “Mission Assurance Issues with the Federal Aviation Administration’s Policy to Implement GPS Navigational System,” The 2010 International Conference on Security and Management, July, 2010.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Invited speaker at the Joint Engineer Operations Course, presented the GEM degree program and current research to Army, Navy, and Marine engineering officers, Jun 2010.

Research presentation addressing retention of company grade officers in the Air Force’s civil engineering occupational specialty and mentorship at the annual Society of American Military Engineers’ meeting. Atlanta, GA, May 2010.

GEM research presentation addressing current and future research at the annual Society of American Military Engineers’ national conference. Atlanta, GA, May 2010.

Invited speaker for the Air Force Civil Engineer Senior Strategic Leadership Seminar on leadership and command, Air Force Institute of Technology Civil Engineer School, Ohio, Nov 2009 & Feb 2010.

Completed Air War College in Correspondence.

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

SPONSOR FUNDED RESEARCH PROJECTS

“Characterization of Air Emissions and Geospatial Exposure Modeling from Burning of Waste at Deployed Military Locations.” Sponsor: AFMSA. Funding: \$290,000.

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

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

SPONSOR FUNDED RESEARCH PROJECTS

“Automated Approaches for System Engineering Innovation in S&T Lab Environment.” Sponsor: DAGSI.
Funding: \$20,160. [CSE]

REFEREED JOURNAL PUBLICATIONS

Swenson, E.D. and Soni S., “Damage Detection in a Geometrically Constrained Area,” *Journal of Structural Longevity*, 2010.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Eric D. Swenson, Hitesh Kapoor and Som R. Soni , "Effects of Z-pins on Lamb Waves in Composite Plates", SPIE Conference on Smart Materials, March 2010, LA, California.

Eric D. Swenson, Som R. Soni and Hitesh Kapoor, "Lamb Wave Propagation in Z-pins Reinforced Co-Cured Composite Pi-Joints", SPIE Conference on Smart Materials, March 2010, LA, California.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Visited Colombia to facilitate project startup on "Analysis of Bonded Co-cured Composite Joints" awarded by AFRL/SOARD. Met with Maj General Ulloa for follow up on AFIT outreach with Colombian Air Force.

Met with Colombian Air Force Academy team on AFOSR/SOARD project on analysis of composite co-cured bonded joints.

Served as Director of Center for Rapid Product Development.

Served as Chairman of Rapid Product Development Research to be held on November 12, 2010 at Hope Hotel.

Served as Resource Chair and Board Member of the Honors Seminars of Metropolitan Dayton, Inc.

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

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

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

SPONSOR FUNDED EDUCATIONAL PROJECTS

"Cost Engineering/Analysis Program Development." Sponsor: Naval Sea Systems. Funding: \$190,000. [COA]

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

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Wirthlin, J., (2010) Opportunities and Challenges in the Formal Graduate Education and Use of Lean Principles in the USAF, Presented at the 5th LAI/EdNet Lean Educator Conference, Daytona Beach, FL.

Hughes, R., Barker, D., Jacques, D., Wirthlin, J. (2010) Concept Assessment for a Stage Gate Process, Presented at the 8th Conference on Systems Engineering Research, Hoboken, NJ.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Fass, D., Wirthlin, J. (2010) Robot Wars, Proceedings of the 37th Annual Conference, OBTC: Teaching Conference for Management Educators, Albuquerque, NM, June 16-19, 2010.

Wirthlin, J., Seering, W. and Rebentisch, E. (2010) Emergent System Behaviors of the Enterprise Defense Acquisition System and Resultant Risks to Program Completion, Presented at Space Systems Engineering & Risk Management Symposium, Eighth National Symposium, Los Angeles, CA.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Lean Six Sigma Green Belt Academics, 2010 (USAF AFSSO21).

Co-Chair, Armed Forces System of Systems Education Network Workshop, WPAFB, OH Aug 16-17, 2010.

Journal of Enterprise Transformation, Editorial Board.

IEEE Systems Journal, Associate Editor.

INCOSE Lean Working Group.

LAI Lean Academy, July 2010.

LAI Lean Engineering, July 2010.

AFIT's Air Force Smart Operations for the 21st Century (AFSO21) Leader.

Ad-Hoc member of Committee on Semesters.

Visiting Fellow, Air Force Center for Systems Engineering.

YAMAMOTO, DIRK P., Lt Col,

Assistant Professor, Department of Systems and Engineering Management, AFIT Appointment Date: 2010 (AFIT/ENV); BS, Electrical Engineering, University of Minnesota, MN 1992; MS, Engineering Systems Management, St Mary's University, TX 1995; MS, Public Health (Industrial Hygiene emphasis), University of Utah, UT 2001; Ph.D., Systems Engineering, Air Force Institute of Technology, OH, 2010. Lt Col Yamamoto's research interests include pharmacokinetic modeling, nanotoxicology, bioaerosol detection and characterization, and occupational/environmental air sampling. Tel: 937-255-3636 x4511 (DSN 785-3636 x4511), email: dirk.yamamoto@afit.edu

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Yamamoto, Dirk P. and Michael L. Shelley. "Developing a Mathematical Approach to Assess Nanoparticle Toxicokinetics" (poster presentation). 2010 American Industrial Hygiene Conference & Exposition. Denver CO, 2010.

Yamamoto, Dirk P. and Michael L. Shelley. "Mathematical Modeling of Cellular Transport Phenomena in a PBPK Model for Nanoparticle Exposures" (podium presentation). 2010 American Industrial Hygiene Conference & Exposition. Denver CO, 2010.

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: \$5,000. [ANT]

“CubeSat Capabilities Study.” Sponsor: N/A. Funding: \$110,000. [ANT]

“Collaborative Control for Multiple UAV Operations.” Sponsor: AFRL/RB. Funding: \$20,000. [ANT]

FISHER, KENNETH A., Department of Electrical and Computer Engineering

SPONSOR FUNDED RESEARCH PROJECTS

“Air-to-Air Missile Flight Path Reconstruction.” Sponsor: AFTPS. Funding: \$25,000. [ANT]

HOPKINSON, KENNETH M., Department of Electrical and Computer Engineering

SPONSOR FUNDED RESEARCH PROJECTS

“A Context-Aware Approach for Enabling Large-Scale Mobile Networks.” Sponsor: AFOSR. Funding: \$39,853. [ANT]

“Technical Support: Cognitive and Mobile Networks.” Sponsor: AFRL/RI. Funding: \$75,000. [ANT]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Tiwari, A., Ganguli, A., Shen, B., Krishnamurthi, N., Gerla, G., Compton, M., and Hopkinson, K., Feasibility of Communication Planning in Airborne Networks Using Mission Information, *2009 Military Communications Conference (MILCOM)*, 18 - 21 October 2009, Boston, MA, USA, pp. 1-7. [ANT]

Gocmen, M., Hopkinson, K.M., Compton, M., The Benefits of a Network Tasking Order in Combat Search and Rescue Missions, *2009 Military Communications Conference (MILCOM)*, 18 - 21 October 2009, Boston, MA, USA, pp. 1-7. [ANT]

MENDENHALL, MICHAEL J., Department of Electrical and Computer Engineering

SPONSOR FUNDED RESEARCH PROJECTS

“Dismount and Change Detection.” Sponsor: AFRL/RB. Funding: \$30,000. [ANT]

“Sensor Exploitation for Human MASINT.” Sponsor: 711 HPW/RH. Funding: \$50,000. [ANT]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

K. Vongsy and M.J. Mendenhall, "Improved Change Detection Through Post Change Classification: A Case Study Using Synthetic Hypersepctral Imagery," Second Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing, IEEE WHISPERS, Reykjavik Iceland, 14-16 June 2010, pp. 1-4. [ANT]

A. Yarbrough, M.J. Mendenhall, and R.K. Martin, "The effects of Atmospheric Mis-Estimation on Hyperspectral-Based Adaptive Matched Filter Target Detection as Measured by the Bhattacharyya Coefficient," Second Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing, IEEE WHISPERS, Reykjavik Iceland, 14-16 June 2010, pp. 1-4. [ANT]

J.D. Clark, M.J. Mendenhall, and G.L. Peterson, "Stochastic Feature Selection With Distributed Feature Spacing for Hyperspectral Data," Second Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing, IEEE WHISPERS, Reykjavik Iceland, 14-16 June 2010, pp. 1-4. [ANT]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Transitioned human skin detection technology to the Air Force Special Operations Command. [ANT]

Technical Reviewer, Elsevier Knowledge-Based Systems. [ANT]

Technical Reviewer, IEEE Transactions on Geoscience and Remote Sensing. [ANT]

Technical Reviewer, IEEE 2nd Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing. [ANT]

Program Committee, IEEE 2nd Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing. [ANT]

PACHTER, MEIR, Department of Electrical and Computer Engineering

SPONSOR FUNDED RESEARCH PROJECTS

"Blended Covert Navigation." Sponsor: AFRL/RV. Funding: \$15,000. [ANT]

"Decision Support Techniques." Sponsor: AFRL/RV. Funding: \$15,000. [ANT]

REFEREED JOURNAL PUBLICATIONS

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. [ANT]

D. Jacques, J. Bode and M. Pachter: "Optimization of an Autonomous Weapon's Operating Characteristic," IEEE Systems Journal, Vol. 3, No 4, pp. 489-498, December 2009. [ANT]

M. Pachter and K. Pham: "Discrete-Time Linear-Quadratic Dynamic Games," Journal of Optimization Theory and Applications, Vol.146/2, August 2010. [ANT]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

M. Pachter and K. Pham: "The Role of Information in Linear-Quadratic Games," 2nd International Conference on the Dynamics of Information Systems, Destin, FL, February 3-5, 2010. [ANT]

M. Pachter and G. Mutlu: "The Navigation Potential of Ground Feature Tracking - the 3-D Case," 50th Israel Annual Conference on Aerospace Sciences, February 17-18, 2010, Tel Aviv, Israel. [ANT]

M. Pachter: "Static Linear-Quadratic Gaussian Games," 14th International Symposium on Dynamic Games and Applications, Banff, Canada, June 20-22, 2010. [ANT]

M. Pachter and G. Mutlu: "The Navigation Potential of Ground Feature Tracking for Aircraft Navigation," American Control Conference, Baltimore, MD, June 30 - July 2, 2010. [ANT]

"Approximate Dynamic Programming with State Aggregation applied to Perimeter Patrol," AIAA Guidance, Navigation and Control Conference, Toronto, Canada, 2-5 August 2010. AIAA paper 2010-8436. [ANT]

"The Navigation Potential of Ground Feature Tracking for Aircraft Navigation," American Control Conference, Baltimore, MD, June 30 - July 2, 2010. [ANT]

BOOKS AND CHAPTERS IN BOOKS

P. Chandler and M. Pachter: "Challenges," in "Unmanned Aerial Vehicles Cooperative Decision and Control: Challenges and Practical Approaches," T. Shima and S. Rasmussen, Editors. Book published by SIAM, 2009, pp. 15-35. [ANT]

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. Book published by SIAM, 2009, pp. 104-124. [ANT]

M. Pachter: "The LQG Game Against Nature," in Advances in Dynamic Games and Their Applications, P. Bernhard, V. Gaitsgory and O. Pourtallier editors, Birkhauser 2009, pp. 339-353. [ANT]

J. BODE, D. JACQUES AND M. PACHTER: "Optimal Control of the Weapon Operating Characteristic with Control Inequality Constraints," *Optimization and Cooperative Control Strategies*, LNCS, Springer, 2009. [ANT]

J. Baker, R. Holsapple, A. Girard, M. Pachter and P. Chandler: "Operator - Aided Decision Processes for Unmanned Aerial Vehicles in a Stochastic Environment," *Optimization and Cooperative Control Strategies*, LNCS, Springer, 2009. [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: \$120,000. [ANT]

"UBR-Brawler." Sponsor: AFMC. Funding: \$100,000. [ANT]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Hooper, D.J., Peterson, G.L., and Borghetti, B.J., "Dynamic Coalition Formation under Uncertainty," *Proceedings of the 2009 IEEE/RSJ International Conference on Intelligent Robots and Systems*, St Louis, MO, October 2009, pp. 4799-4804. [ANT]

RAQUET, JOHN F., Department of Electrical and Computer Engineering

SPONSOR FUNDED RESEARCH PROJECTS

“ANT Center Laboratory Support per Attachment 6 of the MOA between AFIT and AFRL.” Sponsor: AFRL/RV. Funding: \$429,035. [ANT]

“Non-GPS Navigation Using Radio-Based Ranging Combined with Additional Sensors.” Sponsor: Raytheon. Funding: \$100,000. [ANT]

“Low-Cost GPS Receiver Algorithm Development.” Sponsor: OSURF. Funding: \$50,000. [ANT]

“Precision Indoor and Outdoor Navigation Using Existing Signals of Opportunity and Inertial Navigation Sensors.” Sponsor: DAGSI. Funding: \$81,650. [ANT]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

McGinthy, J. and J. Raquet, “GNSS Software Receiver Development,” presented at 2010 Joint Navigation Conference, Orlando, FL, Jun 2010. [ANT]

Larson, C. and J. Raquet, “The Impact of Attitude on Image-Based Integrity,” Proceedings of ION International Technical Meeting, San Deigo, CA, Jan 2010. [ANT]

Kauffman, K., J. Morton, J. Raquet, and D. Garmatyuk, “Simulation Study of UWB-OFDM SAR for Dead Reckoning Navigation,” Proceedings of ION International Technical Meeting, San Deigo, CA, Jan 2010. [ANT]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Raquet, J. “GNSS Navigation Solution and Differential GNSS,” presented to 50 professors and students at Satellite Navigation Science and Technology Workshop for Africa, April 2010. [ANT]

Raquet, J. “A Framework for Image-Based Navigation,” presented to 25 engineers at Nokia Research, Tampere, Finland, April 2010. [ANT]

AFIT PI for the Consortium of Ohio Universities on Navigation and Timekeeping (COUNT). [ANT]

Office of the Secretary of Defense (OSD) PNT S&T Roadmap, Jan 07 – present. Helping to update the OSD PNT S&T Roadmap, which is a document describing the S&T activities for PNT technology over the next 20 years. [ANT]

Executive Vice President, Institute of Navigation (ION) Satellite Division. [ANT]

Scientific (organizing) committee, International Conference on Ubiquitous Positioning, Indoor Navigation and Location-Based Service, Helsinki, Finland, Oct 2009. [ANT]

Awards Committee Member, Institute of Navigation. [ANT]

AFRL/RV, Consulting support for LEGAND program, Mar 2008 – present. [ANT]

DARPA, consulting support for S-BUG navigation program, Jan 2009 – present. [ANT]

SPAWAR Systems Center (Navy), Consulting support for INS/GPS integration, Apr 2009 – present. [ANT]

STEPANIAK, MICHAEL J., Lt Col, Department of Electrical and Computer Engineering

SPONSOR FUNDED RESEARCH PROJECTS

“Integrated Precision Ordnance Delivery System.” Sponsor: DTRA. Funding: \$95,000. [ANT]

VETH, MICHAEL J., Lt Col, Department of Electrical and Computer Engineering

SPONSOR FUNDED RESEARCH PROJECTS

“Architecture Trade Study and Simulations on the Integratin of Atom-Optic Inertial Technology with GPS and the Integration with Auxiliary Inertial Technology.” Sponsor: AFRL/RV. Funding: \$29,500. [ANT]

“Multi-Sensor Collection for Vision-Based Navigation and Targeting.” Sponsor: Draper Laboratory. Funding: \$80,000. [ANT]

“Synchronized Image-Inertial Data Collection and Processing System: Phase II.” Sponsor: NGA. Funding: \$100,000. [ANT]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

“Sensor Modeling and Sensitivity Analysis for Next Generation Time-Space Position Information (TSPI) System,” Smearcheck, M., Veth, M.J., Zangaro, C., Proceedings of ION International Technical Meeting 2010, San Diego, CA. [ANT]

“Tightly-Coupled Image-Aided Inertial Relative Navigation Using Statistical Predictive Rendering (SPR) Techniques and a Priori World Models,” Beich, J., Veth, M.J., Proceedings of ION/IEEE PLANS2010, May 2010. [ANT]

“Passive Indoor Image-Aided Inertial Attitude Estimation Using a Predictive Hough Transformation,” Borkowski, J.M., Veth, M.J., Proceedings of ION/IEEE PLANS2010, May 2010. [ANT]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

“PNT Challenges for Unmanned Aerial Vehicles” (invited presentation), Veth, M.J., Presented to the 3rd Annual Stanford PNT Symposium, October 2009. [ANT]

“Passive Indoor Image-Aided Inertial Attitude Estimation Using a Predictive Hough Transformation,” Borkowski, J.M., Veth, M.J., Proceedings of JSDE Joint Navigation Conference, June 2010. [ANT]

“Laser-Aided Monocular Image Navigation for Embedded Applications,” Yates, D. J., Veth, M.J., Proceedings of JSDE Joint Navigation Conference, June 2010. [ANT]

“Fusion of OFDM Signals of Opportunity and Inertial Sensors for Unassisted Navigation,” J. Crosby, R. K. Martin, J. Raquet, and M. Veth, Joint Navigation Conference (JNC), June 2010. [ANT]

Served as President of the Institute of Navigation, Dayton Chapter 2008-2009. [ANT]

Session chair, ION GNSS 2010. [ANT]

Session chair, ION/JSDE JNC 2010. [ANT]

Instructor, Alternative Navigation Short Course, ION/JSDE JNC 2010. [ANT]

Track chair, ION/IEEE PLANS 2010. [ANT]

Judge, ION Autonomous Lawnmower Competition, 2010. [ANT]

Reviewer, Journal of the Institute of Navigation, 2010. [ANT]

Reviewer, International Journal of Micro Air Vehicles, 2010. [ANT]

Instructor, Image-aided Inertial Navigation Short Course, ION/IEEE PLANS 2010. [ANT]

6.2. CENTER FOR CYBERSPACE RESEARCH

Center for Cyberspace Research (CCR)

Director 255-6565 x4278
Associate Director 255-6565 x4445
Executive Program Coordinator 255-3636 x4602
Homepage: <http://www.afit.edu/ccr/>

FACULTY RESEARCH OUTPUT

*Faculty Bios can be found under their respective department listings.

AKERS, GEOFFREY A., Department of Electrical and Computer Engineering

SPONSOR FUNDED RESEARCH PROJECTS

“Radio Frequency Waveform Exploitation.” Sponsor: NSA. Funding: \$50,000. [CCR]

BALDWIN, RUSTY O., Department of Electrical and Computer Engineering

SPONSOR FUNDED RESEARCH PROJECTS

“Autonomic and Cryptographic (ATSPI) Kernel Software Protection System.” Sponsor: AFRL/RY.
Funding: \$80,000. [CCR]

“Tactical SIGINT Technology Program.” Sponsor: NSA. Funding: \$511,000. [CCR]

“Scalable Wireless Airborne Network Security.” Sponsor: AFRL/RI. Funding: \$50,000. [CCR]

“688th Information Operations Wing Technical Support Proposal.” Sponsor: 688 IOW. Funding: \$75,000.
[CCR]

“Technical Support, Air and Cyberspace Analysis.” Sponsor: NASIC. Funding: \$12,000. [CCR]

SPONSOR FUNDED EDUCATIONAL PROJECTS

“Federal Cyber Service: Scholarship for Service (SFS).” Sponsor: NSF. Funding: \$222,804. [CCR]

HUMPHRIES, JEFFREY W., Lt Col, Department of Electrical and Computer Engineering

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Juan Lopez Jr., Eddie A. Mendezllovet, and J.W. Humphries, “Engineering Mission Assurance for the Cyber Security of Supervisory Control and Data Acquisition (SCADA) Systems,” 2010 International Conference on Security and Management (SAM'10), July 12-15, 2010. [CCR]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Lead curriculum developer for PCE Cyber 300 course for new 17D career field. [CCR]

KIM, YONG C., Department of Electrical and Computer Engineering

SPONSOR FUNDED RESEARCH PROJECTS

“Architectural Framework for Evaluating General, Efficient and Measurable Program Protection.” Sponsor: AFOSR. Funding: \$27,767. [CCR]

McDONALD, J. TODD, Lt Col, Department of Electrical and Computer Engineering

REFEREED JOURNAL PUBLICATIONS

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, Sept/Oct., 2009. [CCR]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

James Parham, Yong Kim, J. Todd McDonald, and Michael Grimalia, “Hiding Circuit Components Using Boundary Blurring Techniques,” *IEEE Annual Symposium on VLSI (ISVLSI10)*, 4 pages, Lixouri, Cephalonia, Greece, Jul 2010. [CCR]

J. Todd McDonald, Yong C. Kim, Eric D. Trias, and Michael R. Grimalia. “Using Logic-Based Reduction For Adversarial Component Recovery,” *25th Symposium on Applied Computing, (SIGAPP SAC10)*, vol 3., pp. 1993-2000, Sierre, Switzerland, March 22-26, 2010. [CCR]

Murphy, S, McDonald, J., and Mills, R.F., “An Application of Deception in Cyberspace: Operating System Obfuscation,” 5th International Conference on Information Warfare and Security (ICIW 2010), Dayton OH 8-9 Apr 2010. [CCR]

MILLS, ROBERT F., Department of Electrical and Computer Engineering

SPONSOR FUNDED RESEARCH PROJECTS

“Efficient Auditing to Mitigate the Insider Threat.” Sponsor: NSA. Funding: \$27,450. [CCR]

REFEREED JOURNAL PUBLICATIONS

Beeker, K., Mills, R.F., and Grimalia, M.R., “Applying Deterrence in Cyberspace,” *Information Operations Journal*, Vol. 1, Issue 4, February 2010, pp. 21-27. [CCR]

Dalton, G.C., Edge, K.S., Mills, R.F., and Raines, R.A., “Analyzing Security Risks in Computer and Radio Frequency Identification (RFID) Networks Using Attack and Protection Trees,” *International Journal of Security and Networks*, Vol. 5, Nos. 2/3, 2010, pp. 87-95. [CCR]

Larkowski, M.P., Mills, R.F., and Colombi, J.M., “The Cyberspace Development Dogfight: Tightening the Acquisitions Turn Circle,” *High Frontier*, November 2009, Vol. 6 No. 1, pp. 44-49. [CCR]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Bares, D.C., Trias, E.D., and Mills, R.F., “A Tactical Framework for Cyberspace Situational Awareness,” submitted to 15th International Command and Control Research and Technology Symposium (ICCRTS), Santa Monica CA, 22-24 June 2010. [CCR]

Murphy, S, McDonald, J., and Mills, R.F., “An Application of Deception in Cyberspace: Operating System Obfuscation,” 5th International Conference on Information Warfare and Security (ICIW 2010), Dayton OH 8-9 Apr 2010. [CCR]

Arwood, S., Mills, R.F., and Raines, R.A., "Operational Art and Strategy in Cyberspace," 5th International Conference on Information Warfare and Security (ICIW 2010), Dayton OH 8-9 Apr 2010. [CCR]

Hale, B., Grimaila, M.R., Mills, R.F., and Haas, M. "Communicating Potential Mission Impact Using Shared Mission Representations," 5th International Conference on Information Warfare and Security (ICIW 2010), Dayton OH 8-9 Apr 2010. [CCR]

Myers, J., Grimaila, M.R., and Mills, R.F. "Insider Threat Detection Using Distributed Event Correlation of Web Server Logs," 5th International Conference on Information Warfare and Security (ICIW 2010), Dayton OH 8-9 Apr 2010. [CCR]

Myers, J., Grimaila, M., and Mills, R., "Adding Value to Log Event Correlation Using Distributed Techniques," Proceedings of the Cyber Security and Information Intelligence Research Workshop (CSIIRW 2010), Oak Ridge National Laboratory, Oak Ridge, TN, April 21-23, 2010. [CCR]

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]

MULLINS, BARRY E., Department of Electrical and Computer Engineering

SPONSOR FUNDED RESEARCH PROJECTS

"Cyber Operations Support." Sponsor: 318 Info Op Group. Funding: \$24,000. [CCR]

REFEREED JOURNAL PUBLICATIONS

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 (IJAAACS), Vol. 3, No. 3, April 2010, pp. 350-368. [CCR]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

D. A. Dodge, B. E. Mullins, G. L. Peterson and J. S. Okolica, "Simulating Windows-Based Cyber Attacks Using Live Virtual Machine Introspection," Summer Computer Simulation Conference (SCSC10), Ottawa, Canada, July 2010, pp. 550-555. [CCR]

C.P. Barnard and B. E. Mullins, "BotNet Communication in an Asymmetric Information Warfare Campaign," 5th International Conference on Information Warfare and Security (ICIW 2010), Air Force Institute of Technology, Wright-Patterson AFB OH, 8-9 April 2010, pp. 23-27. [CCR]

N. S. Kovach and B. E. Mullins, "Malware Detection via a Graphics Processing Unit," 5th International Conference on Information Warfare and Security (ICIW 2010), Air Force Institute of Technology, Wright-Patterson AFB OH, 8-9 April 2010, pp. 212-215. [CCR]

B. D. Thomas and B. E. Mullins, "An FPGA-based Malicious DNS Packet Detection Tool," 5th International Conference on Information Warfare and Security (ICIW 2010), Air Force Institute of Technology, Wright-Patterson AFB OH, 8-9 April 2010, pp. 337-342. [CCR]

D. R. Karrels, G. L. Peterson and B. E. Mullins, "RC-Chord: Resource Clustering in a Large-Scale Hierarchical Peer-to-Peer System," IEEE Military Communications Conference (MILCOM 2009), October 2009, pp. 1-7. [CCR]

M. T. Woelfle, M. A. Temple, B. E. Mullins and M. J. Mendenhall, "Detecting, Identifying and Locating Bluetooth Devices Using RF Fingerprints," IEEE Military Communications Conference (MILCOM 2009), October 2009, classified session. [CCR]

BOOKS AND CHAPTERS IN BOOKS

K. R. Schrader, B. E. Mullins, G. L. Peterson and R. F. Mills, "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]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Member, Technical Program Committee for the 6th International Conference on Information Warfare and Security (ICIW 2011). [CCR]

Reviewer, IEEE Military Communications Conference (MILCOM 2010). [CCR]

Member, Technical Program Committee for the Wireless Networking Symposium (WNS) at 2010 IEEE Global Communications Conference (GLOBECOM 2010). [CCR]

Member, Executive Committee for the 5th International Conference on Information Warfare and Security (ICIW 2010). [CCR]

Member, Technical Program Committee for the 5th International Conference on Information Warfare and Security (ICIW 2010). [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: \$50,000. [CCR]

PETERSON, GILBERT L., Department of Electrical and Computer Engineering

SPONSOR FUNDED RESEARCH PROJECTS

"AFIT Support for AFRL Cybercraft Project." Sponsor: AFOSR. Funding: \$50,000. [CCR]

"MEMSENSE: Hypervisor-Based Memory Sensing for Network Defense Applications." Sponsor: AFRL/RI. Funding: \$100,000. [CCR]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Compiled Memory Analysis Tool. Released to FBI Miami Valley Regional Computer Forensics Laboratory (FBI/MVRCFL). Technology being integrated into popular Volatility Memory Analysis Tool by Schatz Forensics Ltd. LDA-SOM Text Mining. Transitioned to Joint Improvised Explosive Device Defense Organization (JIEDDO) ORSA Branch. [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: \$248,829. [CCR]

REFEREED JOURNAL PUBLICATIONS

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 on Autonomous and Adaptive Communications Systems (IJAACS)*, Vol. 3, No. 3, April 2010, pp. 350-368. [CCR]

G. C. Dalton II, K. S. Edge, R. F. Mills, and R. A. Raines, "Analysing Security Risks in Computer and Radio Frequency Identification (RFID) Networks Using Attack and Protection Trees," *International Journal of Security and Networks (IJSN)*, Special Issue on Security and Privacy in RFID Systems. Vol. 5, Nos. 2/3, 2010, pp. 87-95. [CCR]

S. Cooper, C. Nickell, V. Piotrowski, B. Oldfield, A. Abdallah, M. Bishop, B. Caelli, M. Dark, E. K. Hawthorne, L. Hoffman, L. Pérez, C. Pfleeger, R. Raines, C. Schou, and J. Brynielsson, "An Exploration of the Current State of Information Assurance Education." *SIGCSE Bulletin* Vol. 41, No. 4, December 2009, pp. 109-125. [CCR]

J. Schavland, Y. Chan, and R. A. Raines, "Information Security: Designing a Stochastic-Network for Reliability and Throughput," *Naval Research Logistics*, Vol. 56, No. 7, October 2009, pp. 625-641. [CCR]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

T. E. Dube, R. A. Raines, S. K. Rogers, G. L. Peterson, and K. W. Bauer, "An Investigation of Malware Type Classification," 5th International Conference on Information Warfare and Security, Dayton Ohio, April 2010, pp. 398-406. [CCR]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Director, Center for Cyberspace Research and AF Cyberspace Technical Center of Excellence. [CCR]

TEMPLE, MICHAEL A., Department of Electrical and Computer Engineering

SPONSOR FUNDED RESEARCH PROJECTS

"Phase III Support: RF-EW Systems." Sponsor: AFRL/RV. Funding: \$50,000. [CCR]

"Technical Support: Opportunistic Channel Access." Sponsor: DOD Laboratory for Telecommunication Sciences. Funding: \$52,322. [CCR]

6.3. 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.

BAILEY, WILLIAM E., Department of Engineering Physics

REFEREED JOURNAL PUBLICATIONS

Williams, Skip, Givens, Ryan, Lindstrom, Chad, Davis, Doug, Tam, Chung-Jen, and Bailey, William, "Multiple Line-of-Sight Absorption Spectroscopy of a Supersonic Shock Train Part I: System Design, Validation, and Mach 2 Flow Results," *AIAA Journal*, Vol. 47, No.10, pp. 2368-2378, October 2009. [CDE]

CUSUMANO, SALVATORE J., Department of Engineering Physics

SPONSOR FUNDED RESEARCH PROJECTS

"Airborne Aero-Optic Laboratory." Sponsor: HELJTO. Funding: \$150,770. [CDE]

"Airborne Aero-Optic Laboratory." Sponsor: HELJTO. Funding: \$110,000. [CDE]

"Compensation of Aero-Optical and Atmospheric Disturbances via Coherence Phasing Loops of a Fiber Laser Array." Sponsor: AFOSR. Funding: \$75,000. [CDE]

"High Energy Laser-Laser Communication Performance Assessment from Remotely-Sensed Measurements of Atmospheric Beam Scatter." Sponsor: NSF. Funding: \$50,000. [CDE]

"Tactical High Energy Laser Weapon Alignment System Architecture Efficiencies." Sponsor: HELJTO. Funding: \$174,000. [CDE]

SPONSOR FUNDED EDUCATIONAL PROJECTS

"Lecture Series on Development of Lasers in Defense (Grant)." Sponsor: SPIE LaserFest. Funding: \$5,000. [CDE]

REFEREED JOURNAL PUBLICATIONS

Fiorino, S.T., Bartell, R.J., Krizo, M.J., Caylor, G.L., Moore, K.P., Harris, T.R., and Cusumano, S.J., "Worldwide uncertainty assessments of ladar and radar signal-to-noise ratio performance for diverse low altitude atmospheric environments," *Journal of Applied Remote Sensing*, Vol. 4, article no. 043533, June 2010. [CDE]

Fiorino, S.T., Bartell, R.J., Krizo, M.J., McClung, B., Cohen, J.J., Randall, R.M., and Cusumano, S.J., "Broad Spectrum Optical Turbulence Assessments from Climatological Temperature, Pressure, Humidity, and Wind," *Journal of Directed Energy*, Vol. 3, No. 3, pp. 223-238, January 2010. [CDE]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Fiorino, S.T., Randall, R.M., Bartell, R.J., Haiducek, J.D., Spencer, M.F., and Cusumano, S.J., "Field Measurements and Comparisons to Simulations of High Energy Laser Propagation and Off-Axis Scatter," *Proceedings of SPIE*, Vol. 7814, article no. 781424, SPIE Optics and Photonics, San Diego, CA, August 2010. [CDE]

Spencer, M.F., Cusumano, S.J., Schmidt, J.D., and Fiorino, S.T., "Impact of spatial resolution on thermal blooming phase compensation instability," *Proceedings of SPIE*, Vol. 7816, article no. 781608, SPIE Optics and Photonics, San Diego, CA, August 2010. [CDE]

Fiorino, S.T., Grice, P.M., Krizo, M.J., Bartell, R.J., Haiducek, J.D., and Cusumano, S.J., "Lab Measurements to Support Modeling Terahertz Propagation in Brownout Conditions," *Proceedings of SPIE*, Vol. 7671, article no. 767131, SPIE Defense, Security and Sensing Symposium, Orlando, FL, 5-8 April 2010. [CDE]

Fiorino, S.T., Haiducek, J.D., Rice, C.A., Downs, A.D., Krizo, M.J., Bartell, R.J., and Cusumano, S.J., "Field and Laboratory Validation of Surface Layer Optical Turbulence and Off-Axis Irradiance," *Proceedings of SPIE*, Vol. 7685, article no. 768513, SPIE Defense, Security and Sensing Symposium, Orlando, FL, 5-8 April 2010. [CDE]

Leakeas, C.L., Cusumano, S.J., Krizo, M.J., Bartell, R.J., and Fiorino, S.T., "Effects of Thermal Blooming on Systems Comprised of Tiled Subapertures," *Proceedings of SPIE*, Vol. 7696B, article no. 7696B40, SPIE Defense, Security and Sensing Symposium, Orlando, FL, 5-8 April 2010. [CDE]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Fiorino, S.T., Randall, R.M., Ranney, D.P., Bartell, R.J., Krizo, M.J., Cusumano, S.J., and Magee, E.P., "Band Model and Surface Observation Input Updates to the LEEDR Atmospheric Characterization Package," 32nd Review of Atmospheric Transmission Models Meeting, Lexington, MA, 14 June 2010. [CDE]

Magee, E.P., Fiorino, S.T., Randall, R.M., Ranney, D.P., Bartell, R.J., Krizo, M.J., and Cusumano, S.J., "Models for Laser Propagation using Customized LEEDR Atmospheric Characterization," 32nd Review of Atmospheric Transmission Models Meeting, Lexington, MA, 14 June 2010. [CDE]

Fiorino, S.T., Randall, R.M., Echeverria, F., Bartell, R.J., Krizo, M.J., and Cusumano, S.J., "High Energy Laser Tactical Decision Aid (HELTD) for Predictive Avoidance," 5th DEPS Systems Symposium, Monterey, CA, 12-16 April 2010. [CDE]

Fiorino, S.T., Downs, A.D., Bartell, R.J., Krizo, M.J., and Cusumano, S.J., "Three-Dimensional Optical Turbulence Assessments from Doppler Weather Radar for Laser Applications," 5th DEPS Systems Symposium, Monterey, CA, 12-16 April 2010. [CDE]

Bowers, J., Fiorino, S.T., Cusumano, S.J., and Lofthouse, A., "Numerical Investigation of Statistical Turbulence Effects on Beam Propagation through 2-D Laminar Shear Layer," 5th DEPS Systems Symposium, Monterey, CA, 12-16 April 2010. [CDE]

Leakeas, C.L., Cusumano, S.J., Krizo, M.J., Bartell, R.J., and Fiorino, S.T., "Enhanced Performance Model of Laser Weapon Systems Comprised of Multiple Tiled Subapertures; Turbulence and Thermal Blooming Effects," 5th DEPS Systems Symposium, Monterey, CA, 12-16 April 2010. [CDE]

Cusumano, S.J., Velten, V., Bartell, R.J., Krizo, M.J., and Fiorino, S.T., "Track Algorithm Performance against Tactical Targets in Clutter," 5th DEPS Systems Symposium, Monterey, CA, 12-16 April 2010. [CDE]

McCue, J., Cusumano, S.J., Krizo, M.J., Bartell, R.J., and Fiorino, S.T., "Performance Model of Laser Weapon Systems Comprised of Multiple Tiled Subapertures," Directed Energy Professional Society 12th Annual DE Symposium, San Antonio, TX, 2-6 November 2009. [CDE]

Fiorino, S.T., Bartell, R.J., Krizo, M.J., Haiducek, J., Rice, C., Grice, P., Downs, A., and Cusumano, S.J., "Field and Laboratory Validation of Surface Layer Optical Turbulence, Off-Axis Irradiance, and Desert Sand Optical Properties Models," Directed Energy Professional Society 12th Annual DE Symposium, San Antonio, TX, 2-6 November 2009. [CDE]

FIORINO, STEVEN T., Department of Engineering Physics

SPONSOR FUNDED RESEARCH PROJECTS

“Atmospheric Characterization Tool for LEEDR.” Sponsor: Utah State University Research Foundation.
Funding: \$4,956. [CDE]

“CY2010 HELJTO M&S TAWG Product Development.” Sponsor: AFRL/RD. Funding: \$525,000. [CDE]

“High Energy Laser- Joint Technology Office Contracting Officer Technical Representative.” Sponsor: HELJTO.
Funding: \$13,900. [CDE]

“Modeling and Simulation Analysis and Education Support for NASIC/DAPM.” Sponsor: NASIC. Funding:
\$93,000. [CDE]

“Modification of AFIT Atmospheric Effects Software Code for AFRL/RD.” Sponsor: AFMC. Funding: \$50,232.
[CDE]

SPONSOR FUNDED EDUCATIONAL PROJECTS

“2010 AFIT Center for Directed Energy Summer Intern (DESI) Program.” Sponsor: HELJTO. Funding: \$59,513.
[CDE]

“Laser Weapon System Short Course.” Sponsor: NSWC. Funding: \$18,100. [CDE]

REFEREED JOURNAL PUBLICATIONS

Fiorino, S.T., Randall, R.M., Bartell, R.J., Downs A.D., Chu, P., and Fan, C.W., “Climate Change: Anticipated Effects on High Energy Laser Weapon Systems in Maritime Environments,” early online release, *Journal of Applied Meteorology and Climatology*, September 2010, doi: 10.1175/2010JAMC2482.1. [CDE]

Fiorino, S.T., Bartell, R.J., Krizo, M.J., Caylor, G.L., Moore, K.P., Harris, T.R., and Cusumano, S.J., “Worldwide uncertainty assessments of ladar and radar signal-to-noise ratio performance for diverse low altitude atmospheric environments,” *Journal of Applied Remote Sensing*, Vol. 4, article no. 043533, June 2010. [CDE]

Fiorino, S.T., Bartell, R.J., Krizo, M.J., McClung, B., Cohen, J.J., Randall, R.M., and Cusumano, S.J., “Broad Spectrum Optical Turbulence Assessments from Climatological Temperature, Pressure, Humidity, and Wind,” *Journal of Directed Energy*, Vol. 3, No. 3, pp. 223-238, January 2010. [CDE]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Fiorino, S.T., Randall, R.M., Bartell, R.J., Haiducek, J.D., Spencer, M.F., and Cusumano, S.J., “Field Measurements and Comparisons to Simulations of High Energy Laser Propagation and Off-Axis Scatter,” *Proceedings of SPIE*, Vol. 7814, article no. 781424, SPIE Optics and Photonics, San Diego, CA, August 2010. [CDE]

Spencer, M.F., Cusumano, S.J., Schmidt, J.D., and Fiorino, S.T., “Impact of spatial resolution on thermal blooming phase compensation instability,” *Proceedings of SPIE*, Vol. 7816, article no. 781608, SPIE Optics and Photonics, San Diego, CA, August 2010. [CDE]

Fiorino, S.T., Grice, P.M., Krizo, M.J., Bartell, R.J., Haiducek, J.D., and Cusumano, S.J., “Lab Measurements to Support Modeling Terahertz Propagation in Brownout Conditions,” *Proceedings of SPIE*, Vol. 7671, article no. 767131, SPIE Defense, Security and Sensing Symposium, Orlando, FL, 5-8 April 2010. [CDE]

Fiorino, S.T., Haiducek, J.D., Rice, C.A., Downs, A.D., Krizo, M.J., Bartell, R.J., and Cusumano, S.J., “Field and Laboratory Validation of Surface Layer Optical Turbulence and Off-Axis Irradiance,” *Proceedings of SPIE*, Vol. 7685, article no. 768513, SPIE Defense, Security and Sensing Symposium, Orlando, FL, 5-8 April 2010. [CDE]

Leakeas, C.L., Cusumano, S.J., Krizo, M.J., Bartell, R.J., and Fiorino, S.T., "Effects of Thermal Blooming on Systems Comprised of Tiled Subapertures," *Proceedings of SPIE*, Vol. 7696B, article no. 7696B40, SPIE Defense, Security and Sensing Symposium, Orlando, FL, 5-8 April 2010. [CDE]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

President, Wright Memorial Chapter of the American Meteorological Society. [CDE]

Fiorino, S.T., Randall, R.M., Ranney, D.P., Bartell, R.J., Krizo, M.J., Cusumano, S.J., and Magee, E.P., "Band Model and Surface Observation Input Updates to the LEEDR Atmospheric Characterization Package," 32nd Review of Atmospheric Transmission Models Meeting, Lexington, MA, 14 June 2010. [CDE]

Magee, E.P., Fiorino, S.T., Randall, R.M., Ranney, D.P., Bartell, R.J., Krizo, M.J., and Cusumano, S.J., "Models for Laser Propagation using Customized LEEDR Atmospheric Characterization," 32nd Review of Atmospheric Transmission Models Meeting, Lexington, MA, 14 June 2010. [CDE]

Fiorino, S.T., Randall, R.M., Echeverria, F., Bartell, R.J., Krizo, M.J., and Cusumano, S.J., "High Energy Laser Tactical Decision Aid (HELTDA) for Predictive Avoidance," 5th DEPS Systems Symposium, Monterey, CA, 12-16 April 2010. [CDE]

Fiorino, S.T., Downs, A.D., Bartell, R.J., Krizo, M.J., and Cusumano, S.J., "Three-Dimensional Optical Turbulence Assessments from Doppler Weather Radar for Laser Applications," 5th DEPS Systems Symposium, Monterey, CA, 12-16 April 2010. [CDE]

Bowers, J., Fiorino, S.T., Cusumano, S.J., and Lofthouse, A., "Numerical Investigation of Statistical Turbulence Effects on Beam Propagation through 2-D Laminar Shear Layer," 5th DEPS Systems Symposium, Monterey, CA, 12-16 April 2010. [CDE]

Leakeas, C.L., Cusumano, S.J., Krizo, M.J., Bartell, R.J., and Fiorino, S.T., "Enhanced Performance Model of Laser Weapon Systems Comprised of Multiple Tiled Subapertures; Turbulence and Thermal Blooming Effects," 5th DEPS Systems Symposium, Monterey, CA, 12-16 April 2010. [CDE]

Cusumano, S.J., Velten, V., Bartell, R.J., Krizo, M.J., and Fiorino, S.T., "Track Algorithm Performance against Tactical Targets in Clutter," 5th DEPS Systems Symposium, Monterey, CA, 12-16 April 2010. [CDE]

Fiorino, S.T., Randall, R.M., Bartell, R.J., Downs, A., Chu, P., and Fan, C.W., "Climate Change: Anticipated Effects on HEL Weapon Systems in Maritime Environments," Directed Energy Professional Society 12th Annual DE Symposium, San Antonio, TX, 2-6 November 2009. [CDE]

McCue, J., Cusumano, S.J., Krizo, M.J., Bartell, R.J., and Fiorino, S.T., "Performance Model of Laser Weapon Systems Comprised of Multiple Tiled Subapertures," Directed Energy Professional Society 12th Annual DE Symposium, San Antonio, TX, 2-6 November 2009. [CDE]

Fiorino, S.T., Bartell, R.J., Krizo, M.J., Haiducek, J., Rice, C., Grice, P., Downs, A., and Cusumano, S.J., "Field and Laboratory Validation of Surface Layer Optical Turbulence, Off-Axis Irradiance, and Desert Sand Optical Properties Models," Directed Energy Professional Society 12th Annual DE Symposium, San Antonio, TX, 2-6 November 2009. [CDE]

Fiorino, S.T., Atmospheric Effects on Military Systems, presentation to Ohio State Geography students at The Ohio State University, 9 October 2009. [CDE]

GROSS, KEVIN C., Department of Engineering Physics

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Gross, Kevin C., Tremblay, Pierre, Bradley, Kenneth C., Chamberland, Martin, Farley, Vincent, and Perram, Glen P., "Instrument calibration and lineshape modeling for ultraspectral imagery measurements of industrial smokestack emissions," *Proceedings of SPIE*, Vol. 7695, pp. 769516, 2010. [CDE, CMSR]

Macdonald, Douglas J., Hawks, Michael R., and Gross, Kevin C., "Passive ranging using mid-wavelength infrared atmospheric attenuation," *Proceedings of SPIE*, Vol. 7660, pp. 766041, 2010. [CDE]

Moore, Elizabeth A., Gross, Kevin C., Bowen, Spencer J., Perram, Glen P., Chamberland, Martin, Farley, Vincent, Gagnon, Jean-Philippe, Lagueux, Philippe, and Villemaire, Andre, "Characterizing an overcoming spectral artifacts in Imaging Fourier Transform Spectroscopy of turbulent exhaust plumes," NATO Report, RTO-MP-SET-151. [CDE, CMSR]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Key member of the Remote Sensing Group Team, which won the Air Force-wide ST&E Team Award for Exploratory or Advanced Technology Development, July 2010. [CDE, CMSR]

"Investigation of a Turbulent Jet Engine with the Telops Hyper-CAM IFTS," presented at the 4th Telops Scientific Workshop, Baltimore, MD, May 2010 (invited speaker). [CDE, CMSR]

"Investigation of Smokestack Plumes with the Telops Hyper-CAM IFTS," presented at the 4th Telops Scientific Workshop, Baltimore, MD, May 2010 (invited speaker). [CDE, CMSR]

HAGER, GORDON, Department of Engineering Physics

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Hager, Gordon D., and Perram, Glen P., "A three level analytic model for alkali vapor lasers," paper published in Proceedings of High Power Laser Ablation Conference, Santa Fe, NM, April 2010. [CDE]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Hager, Gordon D., and Perram, Glen P., "Extended Saturation Analysis and Analytic Model of Diode Pumped Alkali Lasers," SPIE LASE: Laser Applications in Science and Engineering, San Francisco, CA, January 2010, *Proceedings of SPIE*, Vol. 7581, article no. 75810J, 17 February 2010. [CDE]

HOLTGRAVE, JEREMY C., Lt Col, Department of Engineering Physics

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Miller, Woody S., Sulham, Clifford V., Holtgrave, Jeremy C., and Perram, Glen P., "Effects of mode matching and radial intensity distributions in pulsed, optically pumped rubidium laser," paper published in Proceedings of the High Power Laser Ablation Conference, Santa Fe, NM, April 2010. [CDE]

MARCINIAK, MICHAEL A., Department of Engineering Physics

SPONSOR FUNDED RESEARCH PROJECTS

"Infrared Counter-Countermeasure Research." Sponsor: AFRL/RX. Funding: \$25,000. [CDE]

REFEREED JOURNAL PUBLICATIONS

Cole, W.P., and Marciniak, M.A., "Path-averaged Cn_2 estimation using a laser-and-corner-cube system," *Applied Optics*, Vol. 48, article no. 4256, 2009. [CDE]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Fitzgerald, T.M., and Marciniak, M.A., "Full-Mueller scatter characterization of novel optical and infrared meta-materials," Proceedings of the 13th International Congress and Exposition on Experimental and Applied Mechanics 2010, Curran Associates, Inc., 2010. [CDE]

Fitzgerald, T.M., and Marciniak, M.A., "Full optical scatter analysis for novel photonic and infrared meta-materials," *Advances in Science and Technology*, Vol. 75, pp. 240, 2010. [CDE]

Fitzgerald, T.M., Marciniak, M.A., and Nauyoks, S.E., "Development of a tunable polarimetric scatterometry system in the MWIR and LWIR," *Proceedings of SPIE*, Vol. 7792, article no. 779209, 2010. [CDE]

Hoelscher, M.G., and Marciniak, M.A., "Restoration of scene information reflected from a non-specular surface," *Proceedings of SPIE*, Vol. 7792, article no. 77920L, 2010. [CDE]

Balling, B.L., and Marciniak, M.A., "Comparative BRDF study of several surfaces as potential MWIR diffuse reflectance standards," *Proceedings of SPIE*, Vol. 7453, article no. 74530O-1, 2009. [CDE]

PERRAM, GLEN P., Department of Engineering Physics

SPONSOR FUNDED RESEARCH PROJECTS

"High Power Diode Pumped Alkali Vapor Lasers and Analog Systems." Sponsor: AFRL/RD. Funding: \$352,450. [CDE]

"Hollow Core Fiber Alkali Lasers." Sponsor: AFRL/RD. Funding: \$27,000. [CDE]

"Technical Support for the Center of Excellence for High Energy Lasers." Sponsor: AFRL/RD. Funding: \$41,000. [CDE]

"Thermal Control of Diode Pumped Alkali Lasers Using Heat Pipes." Sponsor: HELJTO. Funding: \$20,000. [CDE]

REFEREED JOURNAL PUBLICATIONS

Anderson, Monte D., and Perram, Glen P., "Frequency tuning of the optical delay in cesium D2 line including hyperfine structure," *Physical Review A*, 81, 033842, 1-4 March 2010. [CDE]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Lange, Matthew A., Pitz, Greg A., and Perram, Glen P., "The effect of residence time on the production of singlet oxygen in microwave and RF discharges," High Power Laser Ablation Conference, Santa Fe, NM, April 2010. [CDE]

Miller, Woody S., Sulham, Clifford V., Holtgrave, Jeremy C., and Perram, Glen P., "Effects of mode matching and radial intensity distributions in pulsed, optically pumped rubidium laser," High Power Laser Ablation Conference, Santa Fe, NM, April 2010. [CDE]

Hager, Gordon D., and Perram, Glen P., "A three level analytic model for alkali vapor lasers," High Power Laser Ablation Conference, Santa Fe, NM, April 2010. [CDE]

Guild, Eric M., Anderson, Monte D., and Perram, Glen P., "Frequency dependent optical delay with gain in the Cesium diode pumped alkali laser system," High Power Laser Ablation Conference, Santa Fe, NM, April 2010. [CDE]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Thornton, Douglas, and Perram, Glen P., "Rates for Velocity Changing Collisions in Optically Pumped Rubidium Laser," 41st AIAA Plasmasdynamics and Lasers Conference, Chicago, IL, 28 June 2010, AIAA-2010-4880. [CDE]

Sulham, Clifford V., and Perram, Glen P., "Temporal Dynamics of an Optically Pumped Alkali Laser at High Pump Intensity," 41st AIAA Plasmasdynamics and Lasers Conference, Chicago, IL, 28 June 2010, AIAA-2010-4879. [CDE]

Pitz, Greg A., Sulham, Clifford V., and Perram, Glen P., "Alkali Lasers Operating in the Infrared and Blue Pumped by Two Red Photon Absorption," 41st AIAA Plasmasdynamics and Lasers Conference, Chicago, IL, 28 June 2010, AIAA-2010-4876. [CDE]

Hager, Gordon D., and Perram, Glen P., "Extended Saturation Analysis and Analytic model of Diode Pumped Alkali Lasers," SPIE LASE: Laser Applications in Science and Engineering, San Francisco, CA, January 2010, *Proceedings of SPIE*, Vol. 7581, pp. 75810J, 17 February 2010. [CDE]

Anderson, Monte, and Perram, Glen P., "Slow Light in Cesium vapor: Pulse Delay Measurements and Predicted Delay," SPIE LASE: Laser Applications in Science and Engineering, San Francisco, CA, January 2010, *Proceedings of SPIE*, Vol. 7612, pp. 76120A, 8 February 2010. [CDE]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Fox, Charles D., Wertpeny, Douglas E., Pitz, Greg A., and Perram, Glen P., "Lineshapes for optically pumped cesium lasers," 2010 IEEE National Aerospace and Electronics Conference, Dayton, OH, July 2010. [CDE]

Acosta, Ericka A., Jones, Paul, Sulham, Clifford, and Perram, Glen P., "Energy Pooling Kinetics in Diode Pumped Alkali Lasers," 2010 IEEE National Aerospace and Electronics Conference, Dayton, OH, July 2010. [CDE]

Perram, Glen, Sulham, Clifford, and Pitz, Greg, "Blue and IR alkali lasers pumped by multi-photon absorption," SPIE Newsroom, February 2010. [CDE]

Thornton, Douglas E., Phillips, Grady T., and Perram, Glen P., "Inter-modulated, sub-Doppler Saturation Spectroscopy of the $F=2$ Hyperfine Component of the 87Rb D2 Line," 12th Annual Directed Energy Symposium, San Antonio, TX, 2-6 November 2009. [CDE]

Sulham, Clifford V., Perram, Glen P., Hostutler, David A., and Wilkenson, Michael P., "Pulsed, Optically-Pumped Rubidium Laser Scaled to 24 x Threshold," 12th Annual Directed Energy Symposium, San Antonio, TX, 2-6 November 2009. [CDE]

Pitz, Greg A., Jones, Paul, and Perram, Glen P., "Diode Pumped Alkali Laser Kinetics: Energy Pooling and Second Order Processes," 12th Annual Directed Energy Symposium, San Antonio, TX, 2-6 November 2009. [CDE]

Anderson, Monte D., and Perram, Glen P., "Slow Light Delay Predictions and Measurements in Hot Cesium Vapor," Frontiers in Optics and Laser Science, San Jose, CA, 11-15 October 2009. [CDE]

RANDALL, ROBB M., Maj, Department of Engineering Physics

REFEREED JOURNAL PUBLICATIONS

Fiorino, S.T., Randall, R.M., Bartell, R.J., Downs A.D., Chu, P., and Fan, C.W., "Climate Change: Anticipated Effects on High Energy Laser Weapon Systems in Maritime Environments," early online release, *Journal of Applied Meteorology and Climatology*, September 2010. [CDE]

Fiorino, S.T., Bartell, R.J., Krizo, M.J., McClung, B., Cohen, J.J., Randall, R.M., and Cusumano, S.J., "Broad Spectrum Optical Turbulence Assessments from Climatological Temperature, Pressure, Humidity, and Wind," *Journal of Directed Energy*, Vol. 3, No. 3, pp. 223-238, January 2010. [CDE]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Fiorino, S.T., Randall, R.M., Bartell, R.J., Haiducek, J.D., Spencer, M.F., and Cusumano, S.J., "Field Measurements and Comparisons to Simulations of High Energy Laser Propagation and Off-Axis Scatter," *Proceedings of SPIE*, Vol. 7814, article no. 781424, SPIE Optics and Photonics, San Diego, CA, August 2010. [CDE]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Fiorino, S.T., Randall, R.M., Ranney, D.P., Bartell, R.J., Krizo, M.J., Cusumano, S.J., and Magee, E.P., "Band Model and Surface Observation Input Updates to the LEEDR Atmospheric Characterization Package," 32nd Review of Atmospheric Transmission Models Meeting, Lexington, MA, 14 June 2010. [CDE]

Magee, E.P., Fiorino, S.T., Randall, R.M., Ranney, D.P., Bartell, R.J., Krizo, M.J., and Cusumano, S.J., "Models for Laser Propagation using Customized LEEDR Atmospheric Characterization," 32nd Review of Atmospheric Transmission Models Meeting, Lexington, MA, 14 June 2010. [CDE]

Fiorino, S.T., Randall, R.M., Echeverria, F., Bartell, R.J., Krizo, M.J., and Cusumano, S.J., "High Energy Laser Tactical Decision Aid (HELTDA) for Predictive Avoidance," 5th DEPS Systems Symposium, Monterey, CA, 12-16 April 2010. [CDE]

Fiorino, S.T., Randall, R.M., Bartell, R.J., Downs, A., Chu, P., and Fan, C.W., "Climate Change: Anticipated Effects on HEL Weapon Systems in Maritime Environments," Directed Energy Professional Society 12th Annual DE Symposium, San Antonio, TX, 2-6 November 2009. [CDE]

SCHMIDT, JASON D., Maj, Department of Electrical and Computer Engineering

SPONSOR FUNDED RESEARCH PROJECTS

"Advanced Wavefront Estimation in Strong Turbulence." Sponsor: AFOSR. Funding: \$96,456. [CDE]

"Advanced Wavefront Sensing and Control." Sponsor: AFRL/RD. Funding: \$30,000. [CDE]

"Integrated Approach to Free-Space Optical Communications." Sponsor: AFOSR. Funding: \$7,080. [CDE]

"Material Characterization of an Unknown Object Using Passive Remote Sensing." Sponsor: AFOSR. Funding: \$16,120. [CDE]

WEEKS, DAVID E., Department of Engineering Physics

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Blank, L.A., Kedziora, G.S., and Weeks, D.E., “Potential Energy Surfaces for Alkali Plus Noble Gas Pairs – A Systematic Comparison,” *Proceedings of SPIE*, Vol. 7581, article no. 75810I(1-8), 2010, SPIE Photonics West, San Francisco, CA, 25-29 January 2010. [CDE]

6.4. CENTER FOR MASINT STUDIES AND RESEARCH

Center for MASINT Studies and Research [CMSR]

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Homepage: <http://www.afit.edu/cmsr/>

FACULTY RESEARCH OUTPUT

*Faculty Bios can be found under their respective department listings.

BOREL-DONOHUE, CHRISTOPH C., Department of Engineering Physics

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Borel, Christoph C., and Tuttle, Ronald F., “Improving the detectability of small spectral targets through spatial filtering,” *Proceedings of SPIE*, Vol. 7812, pp. 78120K, 2010. [CMSR]

Borel, Christoph C., Tuttle, Ronald F., and Spencer, Clyde, “Improved panchromatic sharpening of multi-spectral image data,” *Proceedings of SPIE*, Vol. 7812, pp. 78120G, 2010. [CMSR]

Gross, Kevin C., Young, Anthony M., Borel, Christoph, Steward, Bryan J., and Perram, Glen P., “Simulating systematic scene-change artifacts in Fourier-transform spectroscopy,” *Proceedings of SPIE*, Vol. 7695, pp. 76951Y, 2010. [CMSR]

Borel, Christoph C., McGrellis, Robert, Juhl, Jonathan, and Tuttle, Ronald F., “Automatic processing of gait video and extraction of features,” paper published in Proceedings of BAMS/ASTS, Laurel, MD, 31 August – 2 September 2010. [CMSR]

Walford, Graham V., Bogard, James S., Gunning, John E., Krichinsky, Alan M., Lewis, Linda A., Smith, Steven E., Gross, Kevin C., Borel, Christoph C., Perram, Glen P., Farley, Vincent, Villemare, Andre, Lux, Gary D., and Patterson, John E., “Enhancing Nuclear Non Proliferation Monitoring by Overlaying Nuclear, Infrared Hyper Spectral FTIR Imaging and Optical Imaging/Scanning Detection Technologies,” paper published in Proceedings of the INMM 51st Annual Meeting, 11-15 July 2010. [CMSR]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Borel, Christoph C., McGrellis, Robert, Juhl, Jonathan, and Tuttle, Ronald F., “Automatic processing of gait video and extraction of features,” talk presented at the BAMS/ASTS meeting, Laurel, MD, 31 August – 2 September 2010. [CMSR]

Walford, Graham V., Bogard, James S., Gunning, John E., Krichinsky, Alan M., Lewis, Linda A., Smith, Steven E., Gross, Kevin C., Borel, Christoph C., Perram, Glen P., Farley, Vincent, Villemare, Andre, Lux, Gary D., and Patterson, John E., “Enhancing Nuclear Non Proliferation Monitoring by Overlaying Nuclear, Infrared Hyper Spectral FTIR Imaging and Optical Imaging/Scanning Detection Technologies,” talk presented at the INMM 51st Annual Meeting, 11-15 July 2010. [CMSR]

GROSS, KEVIN C., Department of Engineering Physics

SPONSOR FUNDED RESEARCH PROJECTS

“OPIR Ground Truth Support.” Sponsor: NASIC. Funding: \$475,000. [CMSR]

REFEREED JOURNAL PUBLICATIONS

Bradley, Kenneth C., Gross, Kevin C., and Perram, Glen P., "Imaging Fourier Transform Spectrometry of Combustion Events," *IEEE Sensors*, Vol. 10, No. 3, pp. 779-785, March 2010. [CMSR]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Walford, Graham V., Bogard, James S., Gunning, John E., Krichinsky, Alan M., Lewis, Linda A., Smith, Steven E., Gross, Kevin C., Borel, Christoph C., Perram, Glen P., Farley, Vincent, Villemaire, Andre, Lux, Gary D., and Patterson, John E., "Enhancing Nuclear Non Proliferation Monitoring by Overlaying Nuclear, Infrared Hyper Spectral FTIR Imaging and Optical Imaging/Scanning Detection Technologies," Proceedings of INMM 51st Annual Meeting, 11-15 July 2010. [CMSR]

Gross, Kevin C., Tremblay, Pierre, Bradley, Kenneth C., Chamberland, Martin, Farley, Vincent, and Perram, Glen P., "Instrument calibration and lineshape modeling for ultraspectral imagery measurements of industrial smokestack emissions," *Proceedings of SPIE*, Vol. 7695, pp. 769516, 2010. [CDE, CMSR]

Gross, Kevin C., Young, Anthony M., Borel, Christoph, Steward, Bryan J., and Perram, Glen P., "Simulating systematic scene-change artifacts in Fourier-transform spectroscopy," *Proceedings of SPIE*, Vol. 7695, pp. 76951Y, 2010. [CMSR]

Gordon, Joe Motos, Gross, Kevin C., Spidell, Matthew T., Pitz, Jeremy J., and Perram, Glen P., "High speed spectral measurements of IED detonation fireballs," *Proceedings of SPIE*, Vol. 7665, pp. 76650S, 2010. [CMSR]

Spidell, Matthew T., Gordon, Joe Motos, Pitz, Jeremy, Gross, Kevin C., and Perram, Glen P., "High speed radiometric measurements of IED detonation fireballs," *Proceedings of SPIE*, Vol. 7668, pp. 76680C, 2010. [CMSR]

Gross, Kevin C., Perram, Glen P., and Tremblay, Pierre, "Jet Engine Exhaust Plume Characterization via Imaging Fourier Transform Spectroscopy," 31st Exhaust Plume and Signatures JANNAF Subcommittee Meeting, October 2009. [CMSR]

Moore, Elizabeth A., Gross, Kevin C., Bowen, Spencer J., Perram, Glen P., Chamberland, Martin, Farley, Vincent, Gagnon, Jean-Philippe, Lagueux, Philippe, and Villemaire, Andre, "Characterizing an overcoming spectral artifacts in Imaging Fourier Transform Spectroscopy of turbulent exhaust plumes," NATO Report, RTO-MP-SET-151. [CDE, CMSR]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Walford, Graham V., Bogard, James S., Gunning, John E., Krichinsky, Alan M., Lewis, Linda A., Smith, Steven E., Gross, Kevin C., Borel, Christoph C., Perram, Glen P., Farley, Vincent, Villemaire, Andre, Lux, Gary D., and Patterson, John E., "Enhancing Nuclear Non Proliferation Monitoring by Overlaying Nuclear, Infrared Hyper Spectral FTIR Imaging and Optical Imaging/Scanning Detection Technologies," INMM 51st Annual Meeting, 11-15 July 2010. [CMSR]

Key member of the Remote Sensing Group Team, which won the Air Force-wide ST&E Team Award for Exploratory or Advanced Technology Development, July 2010. [CDE, CMSR]

"Investigation of a Turbulent Jet Engine with the Telops Hyper-CAM IFTS," presented at the 4th Telops Scientific Workshop, Baltimore, MD, May 2010 (invited speaker). [CDE, CMSR]

"Investigation of Smokestack Plumes with the Telops Hyper-CAM IFTS," presented at the 4th Telops Scientific Workshop, Baltimore, MD, May 2010 (invited speaker). [CDE, CMSR]

HAWKS, MICHAEL R., Lt Col, Department of Engineering Physics

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Macdonald, Douglas J., Hawks, Michael R., and Gross, Kevin C., "Passive ranging using mid-wavelength infrared atmospheric attenuation," *Proceedings of SPIE*, Vol. 7660, pp. 766041, 2010. [CMSR]

PERRAM, GLEN P., Department of Engineering Physics

REFEREED JOURNAL PUBLICATIONS

Bradley, Kenneth C., Gross, Kevin C., and Perram, Glen P., "Imaging Fourier Transform Spectrometry of Combustion Events," *IEEE Sensors*, Vol. 10, No. 3, pp. 779-785, March 2010. [CMSR]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Bostick, Randall L., and Perram, Glen P., "Instrumental Systematic Errors in a Chromotomographic Hyperspectral Imaging System," IEEE Aerospace Conference, Big Sky, MT, March 2010, Proceedings of the 2010 IEEE Aerospace Conference, 5.0703. [CMSR]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Gross, Kevin C., Borel, Chris, White, Allen, Sakai, Stephen, DeVasher, Rebecca, and Perram, Glen P., "First imaging Fourier-transform spectral measurements of detonation in an internal combustion engine," *Proceedings of SPIE*, Vol. 7812, pp. 78120J, 2010. [CMSR]

Walford, Graham V., Bogard, James S., Gunning, John E., Krichinsky, Alan M., Lewis, Linda A., Smith, Steven E., Gross, Kevin C., Borel, Christoph C., Perram, Glen P., Farley, Vincent, Villemare, Andre, Lux, Gary D., and Patterson, John E., "Enhancing Nuclear Non Proliferation Monitoring by Overlaying Nuclear, Infrared Hyper Spectral FTIR Imaging and Optical Imaging/Scanning Detection Technologies," INMM 51st Annual Meeting, 11-15 July 2010. [CMSR]

Gross, Kevin C., Tremblay, Pierre, Bradley, Kenneth C., Chamberland, Martin, Farley, Vincent, and Perram, Glen P., "Instrument calibration and lineshape modeling for ultraspectral imagery measurements of industrial smokestack emissions," SPIE Defense and Security Symposium, 7695-42, Orlando, FL, April 2010, *Proceedings of SPIE*, Vol. 7695, pp. 769516, 12 May 2010. [CMSR]

Gordon, Joe Motos, Gross, Kevin C., Spidell, Matthew T., Pitz, Jeremy J., and Perram, Glen P., "High speed spectral measurements of IED detonation fireballs," SPIE Defense and Security Symposium, 7665-27, Orlando, FL, April 2010, *Proceedings of SPIE*, Vol. 7665, pp. 76650S, 5 May 2010. [CMSR]

Spidell, Matthew T., Gordon, Joe Motos, Pitz, Jeremy, Gross, Kevin C., and Perram, Glen P., "High speed radiometric measurements of IED detonation fireballs," SPIE Defense and Security Symposium, 7668-12, Orlando, FL, April 2010, *Proceedings of SPIE*, Vol. 7668, pp. 76680C, 26 April 2010. [CMSR]

O'Dell, Daniel C., Bostick, Randy, Hawks, Michael R., Swenson, Eric D., Black, Jonathan T., Cobb, Richard G., and Perram, Glen P., "Chromotomographic imager field demonstration results," SPIE Defense and Security Symposium, Orlando, FL, April 2010, *Proceedings of SPIE*, Vol. 7668, pp. 766804, 24 April 2010. [CMSR]

Gross, Kevin C., Perram, Glen P., and Tremblay, Pierre, "Jet Engine Exhaust Plume Characterization via Imaging Fourier Transform Spectroscopy," 31st Exhaust Plume and Signatures JANNAF Subcommittee Meeting, October 2009. [CMSR]

Moore, Elizabeth A., Gross, Kevin C., Bowen, Spencer J., Perram, Glen P., Chamberland, Martin, Farley, Vincent, Gagnon, Jean-Philippe, Lagueux, Philippe, and Villemaire, Andre, “Characterizing an overcoming spectral artifacts in Imaging Fourier Transform Spectroscopy of turbulent exhaust plumes,” NATO Report, RTO-MP-SET-151. [CMSR]

Pitz, Jeremy, Gross, Kevin C., and Perram, Glen P., “Statistical analysis of image Fourier Transform Spectroscopy as an operational plume combustion diagnostic tool,” 35th Dayton-Cincinnati Aerospace Sciences Symposium, 9 March 2010. [CMSR]

TUTTLE, RONALD F., Department of Engineering Physics

SPONSOR FUNDED RESEARCH PROJECTS

“ARL Technical Assistance Program (TAP).” Sponsor: US Army Research Laboratory. Funding: \$125,000. [CMSR]

“Chief Technology Officer (CMSR).” Sponsor: SAF. Funding: \$362,000. [CMSR]

“Counterspace Research & Academic Support.” Sponsor: NASIC. Funding: \$271,456. [CMSR]

“Hyperspectral Technical Assistance Program (HyTAP).” Sponsor: AFRL/RV. Funding: \$200,000. [CMSR]

“Project Incubator.” Sponsor: NASIC. Funding: \$520,000. [CMSR]

“Project Lake Effect.” Sponsor: NASIC. Funding: \$515,000. [CMSR]

“Project Seven- Phase I.” Sponsor: OSD. Funding: \$29,000. [CMSR]

“Project Seven- Phase II & III.” Sponsor: NASIC. Funding: \$150,000. [CMSR]

“Space Analysis Resource Catalog (SpARC).” Sponsor: NASIC. Funding: \$82,998. [CMSR]

SPONSOR FUNDED EDUCATIONAL PROJECTS

“Advanced Geospatial Intelligence Education.” Sponsor: NASIC. Funding: \$450,000. [CMSR]

“Reentry Course: Phase I Startup.” Sponsor: NASIC. Funding: \$15,000. [CMSR]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Borel, Christoph C., and Tuttle, Ronald F., “Improving the detectability of small spectral targets through spatial filtering,” *Proceedings of SPIE*, Vol. 7812, pp. 78120K, 2010. [CMSR]

Borel, Christoph C., Tuttle, Ronald F., and Spencer, Clyde, “Improved panchromatic sharpening of multi-spectral image data,” *Proceedings of SPIE*, Vol. 7812, pp. 78120G, 2010. [CMSR]

Borel, Christoph C., McGrellis, Robert, Juhl, Jonathan, and Tuttle, Ronald F., “Automatic processing of gait video and extraction of features,” paper published in Proceedings of BAMS/ASTS, Laurel, MD, 31 August – 2 September 2010. [CMSR]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Borel, Christoph C., McGrellis, Robert, Juhl, Jonathan, and Tuttle, Ronald F., “Automatic processing of gait video and extraction of features,” talk presented at the BAMS/ASTS meeting, Laurel, MD, 31 August – 2 September 2010. [CMSR]

Dea, J., Fisher, K., Mendenhall, M., Tuttle, R., Weeks, D. (Chair), Chrissis, J., Cunningham, W., Heminger, A., Wirthlin, R., and Paschall, R., "The Implications of the State of Ohio's Universities Move to a Semester Based System," Report of the 2009-2010 Faculty Council Ad Hoc Committee, 11 March 2010. [CMSR]

Tuttle, Ronald F., and Hemminger, Donald, "Educating the Air Force Digital Native," AETC Symposium, San Antonio, TX, 14-15 January 2010. [CMSR]

6.5. CENTER FOR OPERATIONAL ANALYSIS

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FACULTY RESEARCH OUTPUT

*Faculty Bios can be found under their respective department listings.

AHNER, DARRYL K., LTC, Department of Operational Sciences

SPONSOR FUNDED RESEARCH PROJECTS

“Impact of Individual Augmentees Study.” Sponsor: OSD. Funding: \$220,000. [COA]

BAKER, WILLIAM P., Department of Mathematics and Statistics

SPONSOR FUNDED RESEARCH PROJECTS

“Pulse Forensics Enhanced Real-time De-interleaving (HORSE).” Sponsor: AFRL/RY. Funding: \$28,000. [COA]

BAUER, KENNETH W., Department of Operational Sciences

SPONSOR FUNDED RESEARCH PROJECTS

“Advanced Research in Automatic Target Recognition.” Sponsor: NASIC. Funding: \$200,000. [COA]

“Advanced Research in Automatic Target Recognition.” Sponsor: CMD/ARSTRAT. Funding: \$25,000. [COA]

“Advanced Research in Automatic Target Recognition.” Sponsor: AFRL/RY. Funding: \$50,000. [COA]

“Sensor Fusion for Automatic Target Recognition.” Sponsor: AFRL/RY. Funding: \$50,000. [COA]

REFEREED JOURNAL PUBLICATIONS

Yuri P. Taitano, Brian A. Geier, and Kenneth W. Bauer Jr., "A Locally Adaptable Iterative RX Detector," EURASIP Journal on Advances in Signal Processing, vol. 2010, Article ID 341908, 10 pages, 2010. [COA]

Bellucci, J.P., Smetek, T.E., and K.W. Bauer, “Improved Hyperspectral Image Processing Algorithm Testing Using Synthetic Imagery and Factorial Designed Experiments,” IEEE Transactions on Geoscience and Remote Sensing, Vol. 48, No. 3, March 2010, pp. 1211-1223. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Loeffelholz, Bernard J. and Kenneth W. Bauer, "An Examination into Robust Parameter Design," In the Proceedings of the Huntsville Simulation Conference, Huntsville, AL, 27-29 Oct 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

“AEDC Study.” Sponsor: HQ AFMC. Funding: \$185,000. [COA]

“AFIT/ENS Support to the Air Force Applications Technical Center.” Sponsor: AFTAC. Funding: \$10,000. [COA]

“OSD CAPE Research Proposal.” Sponsor: OSD. Funding: \$100,000. [COA]

SPONSOR FUNDED EDUCATIONAL PROJECTS

“DOE Education Support to the JSTARS Program.” Sponsor: JSTARS. Funding: \$10,000. [COA]

“DOE Revitalization.” Sponsor: HQ AFMC. Funding: \$357,271. [COA]

CHRISSIS, JAMES W., Department of Operational Sciences

SPONSOR FUNDED RESEARCH PROJECTS

“B-2 Wing Analysis.” Sponsor: AFMC. Funding: \$50,000. [COA]

REFEREED JOURNAL PUBLICATIONS

Kevin T. Kennedy, Richard F. Deckro, Victor P. Wiley and James W. Chrissis “On Modeling and Analyzing Multi-Layered Networks,” *Military Operations Research*, Vol. 14, No. 3, (2009), pp. 53-66. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

T. Paciencia and J. Chrissis, “An Optimization Method for Stochastic Systems with Multiple Objectives,” 13th AIAA/ISSMO Multidisciplinary Analysis and Optimization Conference, 13-15 Sept 2010, Ft Worth, TX. [COA]

COCHRAN, JEFFERY K., Department of Operational Sciences

REFEREED JOURNAL PUBLICATIONS

Kokangul, A., Khaniyev, T., and Cochran J.K., “Optimal Control of Work-In-Process Inventory of a Two-Station Production Line,” *Optimal Control, Applications, and Methods* 31:3, pp. 201-211 (2010). [COA]

Cochran, J.K. and Broyles, J.R., “Developing Nonlinear Queuing Regressions to Increase Emergency Department Patient Safety: Approximating Reneging with Balking,” *Computers and Industrial Engineering* 59:3, pp. 378-386 (2010). [COA]

CUNNINGHAM, WILLIAM A., Department of Operational Sciences

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Bell, John, Stanley Griffis, and William Cunningham, “Location Analysis: A Strategic Network for Homeland Defense,” Proceedings of the 2010 Western Decision Sciences Annual Meeting, Lake Tahoe, NV April 6-9, 2010. This paper won the Best Paper Award from all papers submitted to Western DSI. [COA]

Bell, John E., Joseph B. Skipper, William A. Cunningham, Daniel D. Mattioda, and Krista LaPietra (April 6-9 2010), "Location Consolidation of Military Equipment for Deployment," Proceedings of the 2010 Western Decision Science Institute Annual Meeting, Lake Tahoe, NV. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

"An Optimization of the Hub-and-spoke Distribution Network in United States European Command," Stephan Brady, Lt Col Ben Skipper, William Cunningham. 2009 INFORMS Annual Meeting in San Diego, California, November 2009. [COA]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

INFORMS Southern Regional Conference, 5-7 April 2010, Huntsville AL (E. Kiymaz, A. Johnson, and W. Cunningham), "Fuel Efficiency Assessment with DEA." [COA]

DONOVAN, PAMELA S., Lt Col, Department of Operational Sciences

SPONSOR FUNDED RESEARCH PROJECTS

"CRAF Study." Sponsor: HQ AMC. Funding: \$175,000. [COA]

HALL, SHANE N., Maj, Department of Operational Sciences

SPONSOR FUNDED RESEARCH PROJECTS

"Analysis of Noncombatant Evacuation Operations." Sponsor: USEUCOM. Funding: \$45,920. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Roesener, A.G., Hall, S.N., and Özen, Y.G., 2010, "An Integer Programming Formulation for a Single Pallet in the Airlift Loading Problem with Insufficient Aircraft," WORLDCOMP 2010 (The 2010 World Congress in Computer Science, Computer Engineering, and Applied Computing), Las Vegas, NV, July 12-15, 2010. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Jeong, G.S., Hall, S.N., and Weir, J.D., 2010, "A Multi-objective Approach to a Bipartite Assignment Matching Problem using Weighted Values from Multiple Constraints," Working Groups 20 (Manpower and Personnel) and 31 (Computing Advances in OR), 78th Military Operations Research Society Symposium, Quantico, VA, June 21-24, 2010. [COA]

Hall, S.N., Roesener, A.G., and Özen, Y.G., 2010, "A Hybrid Genetic Algorithm Approach to the Airlift Loading Problem with Insufficient Aircraft," ALIO-INFORMS Joint International Meeting, Buenos Aires, Argentina, June 6-9, 2010. Invited session. [COA]

Hall, S.N., Jacobson, S.H., and Sewell, E.C., 2009, "An Analysis of Pediatric Vaccine Formulary Selection Problems," INFORMS Annual Meeting, San Diego, CA, October 11-14, 2009. Nominated: Pierskalla Award (best paper in health applications). [COA]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Geyer, A.J., Hall, S.N., and Moore, J.T., 2009, "Operations-focused Optimized Theater Weather Sensing Strategies Using Preemptive Binary Integer Programming," The McNaughton Sessions, Royal Military College, Kingston, Ontario, Canada. Invited speaker. [COA]

HILL, RAYMOND R., Department of Operational Sciences

SPONSOR FUNDED RESEARCH PROJECTS

“Flash/Function Characterization Model.” Sponsor: 780 TS/OL-AC. Funding: \$160,000. [COA]

REFEREED JOURNAL PUBLICATIONS

Aleman, R. E. and R. R. Hill. April 2010. A Tabu Search with Vocabulary Building Approach for the Vehicle Routing Problem with Split Demands. *International Journal of Metaheuristics*, Vol. 1, No. 1, 55-80. [COA]

Aleman, R., X. Zhang and R. R. Hill, June 2010. An Adaptive Memory Algorithm for the Split Delivery Vehicle Routing Problem. *Journal of Heuristics*, Vol. 16, No. 3, 441-473. [COA]

Champagne, L. E. and R. R. Hill, October 2009. A Simulation Validation Method Based on Bootstrapping Applied to an Agent-Based Model of the Bay of Biscay Historical Scenario. *Journal of Defense Modeling and Simulation: Applications, Methodology, Technology* Vol. 6, No. 4, 201-212. [COA]

Hardman, N., Colombi, J., Jacques, D., Hill, R., Miller, J. 2009. An Evaluation of Collision Avoidance Technologies Using Empirical Function Allocation. *International Journal of Applied Aviation Studies*, Vol. 9, No. 2, 133-154. [COA]

Heath, B. L., Ciarallo, F. and Hill, R. R. October 2009. A Survey of Agent-Based Modeling Practices (January 1998 to July 2008), *Journal of Artificial Societies and Social Simulation*, Vol. 12, No. 4, October 2009. [COA]

Hill, R. R. 2009. AFIT’s Graduate-level Test and Evaluation Certificate Program, *Phalanx*, Vol. 42, No. 4, 35-36, December 2009. [COA]

Johnson, A., Heiman, T., Cooper, M., and Hill, R., 2010, “Assessing Transport Aircraft Inspection Strategies” *International Journal of Operations Research and Information Systems*. 1(4): 1-21. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Heath, B. L., Ciarallo, F. and R. R. Hill. June 2010. An Exploratory Agent-Based Model of Warehouse Picking Operations with Congestion, Abstract 781. Institute of Industrial Engineering Research Conference, Cancun, Mexico. [COA]

Hill, R. R. and D. A. Leggio, Feb 2010. A Monte Carlo Study Examining the Potential of Experimental Design Strategies for Wind Tunnel Testing. AIAA-2010-1715. USAF T&E Days, Nashville, TN, 2-4 February 2010. [COA]

Hardman, N., J. Colombi, D. Jacques, R. Hill and J. Miller, “Application of a Seeded Genetic Algorithm for User Interface Design.” Proceedings of the IEEE Systems, Man, and Cybernetics Conference, San Antonio TX, October 2009. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Experimental Design Issues in LVC, Live Virtual Constructive 15th Annual Conference, El Paso, TX, January 11-14, 2010. [COA]

Examining Issues Associated with the use of Live, Virtual, Constructive (LVC) Simulation in Test and Evaluation, WG-2540, Military Operations Research Society Symposium, June 22-24, 2010, Quantico, VA, with E. Bjorkman and D. Hodson. [COA]

Using Live, Virtual, Constructive Distributed Simulation Environments for Analysis, WG-2553, Military Operations Research Society Symposium, June 22-24, 2010, Quantico, VA, with E. Bjorkman, D. Hodson, and M. Cerniglia-Mosher. [COA]

Using Live, Virtual, Constructive (LVC) Simulations to Conduct Test and Evaluation for System of Systems, WG-2547, Military Operations Research Society Symposium, June 22-24, 2010, Quantico, VA, with E. Bjorkman and D. Hodson. [COA]

BOOKS AND CHAPTERS IN BOOKS

Heath, Brian L. and Raymond R. Hill, "Agent-Based Modeling: A Historical Perspective and a Review of Validation and Verification Efforts" book chapter, Chapter 3, Handbook of Research on Discrete Event Simulation Environments: Technologies and Applications, edited by Evon Abu-Taieh, IGI Publishing, Hershey, PA, 2010. [COA]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Published, along with Rene Seguin of the Canadian Operations Research Society, "MAS-CORS Cluster at the CORS-INFORMS Joint International Conference," a summary of the Military Applications track they organized, in the Military Operations Research periodical, Phalanx, Vol. 42, No. 3. [COA]

IIE Industrial Engineering Research Conference, 5-9 June 2010, Cancun Mexico (C. Guler, A. Johnson, M. Cooper, and R. Hill), "Energy Industry Economic Impacts from Ohio River Transportation Disruption." [COA]

Ohio Transportation Safety Awareness Seminar, 11 November 2009, Cincinnati OH (C. Guler, A. Johnson, M. Cooper, and R. Hill), "Coal Distribution Implications of Ohio River Disruption." [COA]

JOHNSON, ALAN W., Department of Operational Sciences

REFEREED JOURNAL PUBLICATIONS

Vann, L., Anderson, B., and Johnson, A.W., 2009, "Feasibility of JP-8 to Jet A fuel conversion at U.S. military facilities" *Journal of Transportation Management* 20(1): 59-72. [COA]

Johnson, A., Heiman, T., Cooper, M., and Hill, R., 2010, "Assessing Transport Aircraft Inspection Strategies" *International Journal of Operations Research and Information Systems*. 1(4): 1-21. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Ford, T., Ogden, J., and Johnson, A., "A Method for Measuring Supply Chain Interoperability," Proceedings of the IIE Industrial Engineering Research Conference, Cancun, Mexico, 5-9 Jun 10. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Molina, C., Johnson, A., and Roesener, A., "Reusable Launch Vehicle Design Implications for Regeneration Time." Proceedings of the American Institute of Aeronautics and Astronautics Space 2009 Conference, Pasadena CA, AIAA-2009-6471. [COA]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

IIE Industrial Engineering Research Conference, 5-9 June 2010, Cancun Mexico (C. Guler, A. Johnson, M. Cooper, and R. Hill), "Energy Industry Economic Impacts from Ohio River Transportation Disruption." [COA]

INFORMS Southern Regional Conference, 5-7 April 2010, Huntsville AL (E. Kiymaz, A. Johnson, and W. Cunningham), “Fuel Efficiency Assessment with DEA.” [COA]

Presentation to AMC/A3/A9, 12 February 2010, Scott AFB IL (E. Kiymaz and A. Johnson), “C-17 Fuel Efficiency Measurement.” [COA]

Ohio Transportation Safety Awareness Seminar, 11 November 2009, Cincinnati OH (C. Guler, A. Johnson, M. Cooper, and R. Hill), “Coal Distribution Implications of Ohio River Disruption.” [COA]

INFORMS National Meeting, October 11-13 2009, San Diego CA (C. Molina, A. Johnson, and A. Roesener), “Reusable Launch Vehicle Design Implications.” [COA]

MATTIODA, DANIEL D., Maj, Department of Operational Sciences

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Mattioda, Daniel D., Samir Barman, Warren F. Fisher, Joseph B. Skipper (2009), “Controlled Release Location of Jobs in a Hybrid Job/Flow Shop Environment,” Huntsville Simulation Conference, Huntsville, AL. [COA]

Bell, John E., Joseph B. Skipper, William A. Cunningham, Daniel D. Mattioda, and Krista LaPietra (April 6-9 2010), “Location Consolidation of Military Equipment for Deployment,” Western Decision Science Institute Annual Meeting, Lake Tahoe, NV. [COA]

MILLER, JOHN O., Department of Operational Sciences

SPONSOR FUNDED RESEARCH PROJECTS

“Research, Analysis and Transition Support to the Air Force Global Logistics Support Center.” Sponsor: AFLGLSC. Funding: \$208,400. [COA]

REFEREED JOURNAL PUBLICATIONS

Ponack, Ryan and Miller, J.O. “Capability Assessment of the High Energy Liquid Laser Area Defense System (HELLADS),” *Journal of Directed Energy*, Vol 3 No. 3, pp. 193-209, Winter 2009. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Bednar, E. M., and Miller, J.O. “Player vs. Bot Traffic Analysis Using Artificial Neural Networks,” *Proceedings of Industrial Engineering Research Conference 2010*, Cancun, Mexico, 5-9 June 2010. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Passey, A.J., and Miller, J.O. “Modeling IO Effects with HELIOS,” 78th MORS Symposium, Quantico, VA, 21-24 June 2010. [COA]

MOORE, JAMES T., Department of Operational Sciences

SPONSOR FUNDED RESEARCH PROJECTS

“JDPAC and AFIT Distribution Research Proposal (LOC).” Sponsor: USTRANSCOM. Funding: \$500,000. [COA]

REFEREED JOURNAL PUBLICATIONS

Roesener, A.G., J.W. Barnes, J.T. Moore, and D. Van Veldhuizen, "An Advanced Tabu Search Approach to the Static Airlift Loading Problem," *Military Operations Research* 15 (1): 5-29 (2010). [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Nance, R.L., A.G. Roesener and J.T. Moore, "An Advanced Tabu Search for Solving the Mixed Payload Airlift Loading Problem", Institute for Operations Research and Management Science International Meeting, Buenos Aires, Argentina, 6-9 June 10. [COA]

Goodrich, Preston, A. G. Roesener, and James Moore, "Delivery Time Variance Reduction in the Military Supply Chain," Military Operations Research Society Symposium, Quantico, VA, 22-24 June 2010. [COA]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Geyer, A.J., Hall, S.N., and Moore, J.T., 2009, "Operations-focused Optimized Theater Weather Sensing Strategies Using Preemptive Binary Integer Programming," The McNaughton Sessions, Royal Military College, Kingston, Ontario, Canada. [COA]

OGDEN, JEFFERY A., Department of Operational Sciences

REFEREED JOURNAL PUBLICATIONS

Vance, A., Lowry, P.B., and Ogden, J.A. (2010) "Testing the Potential of RFID to Increase Supply-Chain Agility and to Mitigate the Bullwhip Effect," *International Journal of Applied Logistics*, Vol. 1, No. 1, 48-66. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Ford, T.C., Ogden, J.A., and Johnson, A.W. (2010) "A Method for Measuring Supply Chain Interoperability," published as a full paper and presented at the Industrial Engineering Research Conference, Cancun, Mexico, June 2010. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Ogden, J.A., Gardner, C.P., and Brady S. (2010) "Balancing Government Risks with Contractor Incentives in Performance-Based Logistics Contracts," published as a full paper and presented at the 20th Annual North American Research/Teaching Symposium on Purchasing and Supply Chain Management, Tempe, Arizona, March 2010. [COA]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Presented "Balancing Government Risks with Contractor Incentives in Performance-Based Logistics Contracts" at the North American Research and Teaching Symposium on Purchasing and Supply Management, Tempe, AZ. [COA]

OXLEY, MARK E., Department of Mathematics and Statistics

SPONSOR FUNDED RESEARCH PROJECTS

"Fusion of Disparate Sensor Exploitation Systems." Sponsor: AFOSR. Funding: \$52,000. [COA]

"Sensor Fusion, Tracking, Tools and Consulting." Sponsor: NASIC. Funding: \$15,000. [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.” Sponsor: HQ AFMC. Funding: \$350,000. [COA]

“Research, Analysis and Transition Support to the 478th Aeronautical Systems Group.” Sponsor: AFMC. Funding: \$570,035. [COA]

REFEREED JOURNAL PUBLICATIONS

Timothy J. Pettit, Joseph Fiksel and Keely L. Croxton, “Ensuring Supply Chain Resilience: Development of a Conceptual Framework,” *Journal of Business Logistics*, Spring 2010, Vol. 31, No. 1, pp. 1-21. [COA]

ROESENER, AUGUST G., Maj, Department of Operational Sciences

REFEREED JOURNAL PUBLICATIONS

Roesener, A. G., J. W. Barnes, J. T. Moore, D. A. Van Veldhuizen. 2010. An Advanced Tabu Search Approach to the Static Airlift Loading Problem. *Military Operations Research Journal*: 15:1, 5 – 29 (2010). [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Roesener, A.G., S.N. Hall and Y.G. Ozen. “An Integer Programming Formulation for a Single Pallet in the Airlift Loading Problem with Insufficient Aircraft.” World Congress in Computer Science, Computer Engineering and Applied Computing, Las Vegas, NV, July 12-15, 2010. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Hall, S.N., A.G. Roesener and Y.G. Ozen. “A Hybrid Genetic Algorithm Approach to the Airlift Loading Problem with Insufficient Aircraft.” Institute for Operations Research and Management Science International Meeting, Buenos Aires, Argentina, June 6-9, 2010. [COA]

Nance, R.L., A.G. Roesener and J.T. Moore. “An Advanced Tabu Search for Solving the Mixed Payload Airlift Loading Problem.” Institute for Operations Research and Management Science International Meeting, Buenos Aires, Argentina, June 6-9, 2010. [COA]

Molina, C., Johnson, A., and Roesener, A., “Reusable Launch Vehicle Design Implications for Regeneration Time.” Proceedings of the American Institute of Aeronautics and Astronautics Space 2009 Conference, Pasadena CA, AIAA-2009-6471. [COA]

Goodrich, P., J.T. Moore, and A.G. Roesener. “Variance Reduction in the Military Supply Chain.” Military Operations Research Society Symposium, Quantico, VA, June 22-24, 2010. [COA]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

INFORMS National Meeting, October 11-13 2009, San Diego, CA (C. Molina, A. Johnson, and A. Roesener), “Reusable Launch Vehicle Design Implications.” [COA]

SKIPPER, JOSEPH B., Maj, Department of Operational Sciences

SPONSOR FUNDED RESEARCH PROJECTS

“Leading Edge Supply Chain: Identifying Ways to Improve Weapon Systems Sustainment & Logistics Support.” Sponsor: AFRL/RX. Funding: \$410,000. [COA]

REFEREED JOURNAL PUBLICATIONS

Skipper, Joseph B., Joe B. Hanna, and Brian J. Gibson (2010), “Alabama Power Response to Katrina: Managing a Severe Service Supply Chain Disruption,” *Journal of the International Academy for Case Studies*, Vol. 16, No. 2, pp. 15-22. [COA]

Hanna, Joe B., Dianne J. Hall, and Joseph B. Skipper (2010), “Mitigating Supply Chain Disruption: The Importance of Top Management Support to Collaboration and Flexibility,” *International Journal of Logistics Systems Management*, Vol. 6, No. 4, pp. 397-414. [COA]

Skipper, Joseph B., Joe B. Hanna, and Brian J. Gibson (2010), “Alabama Power Response to Katrina: Managing a Severe Service Supply Chain Disruption,” *Journal of the International Academy for Case Studies*, Vol. 16, No. 1, pp. 21-31. [COA]

Skipper, Joseph B. and Joe B. Hanna (2009), “Minimizing Supply Chain Disruption Risk through Enhanced Flexibility,” *International Journal of Physical Distribution and Logistics Management*, Vol. 39, No. 5, pp. 404-427. IJPDLM 2010 Best Paper Award. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Bell, John E., Joseph B. Skipper, William A. Cunningham, Daniel D. Mattioda, and Krista LaPietra (April 6-9 2010), “Location Consolidation of Military Equipment for Deployment,” Proceedings of the 2010 Western Decision Science Institute Annual Meeting, Lake Tahoe, NV. [COA]

Mattioda, Daniel, Samir Barman, Warren Fisher, and Joseph B. Skipper (2009), “Controlled Release Location of Jobs in a Hybrid Job/Flow Shop Environment,” The Huntsville Simulation Conference, Huntsville, AL. [COA]

Hall, Dianne, Joseph B. Skipper, Heath Landrum, and Joe B. Hanna, (2009), “The Moderating Effect of Information Technology on the Relationship between Comprehensive Planning Processes and Flexible Responsiveness,” 15th Americas Conference on Information Systems, Toronto, Ontario, Canada. [COA]

Hall, Dianne, Joseph B. Skipper, Joe B. Hanna, and Joseph Huscroft (2009), “Reducing Uncertainty and Equivocality in the Supply Chain,” Production and Operations Management Society National Conference, Orlando, FL. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Brady, Stephen, Joseph Skipper, William Cunningham, “An Optimization of the Hub-and-spoke Distribution Network in United States European Command,” 2009 INFORMS Annual Meeting, San Diego, CA, Nov 2009. [COA]

UNGER, ERIC J., Department of Systems and Engineering Management

SPONSOR FUNDED EDUCATIONAL PROJECTS

“Cost Engineering/Analysis Program Development.” Sponsor: Naval Sea Systems. Funding: \$190,000. [COA]

WEIR, JEFFERY D., Department of Operational Sciences

SPONSOR FUNDED RESEARCH PROJECTS

“Center for Operational Analysis (COA) Support.” Sponsor: JFCC. Funding: \$200,000. [COA]

“Research, Analysis and Transitional Support to the United States Strategic Command Joint Force Component Command for Intelligence, Surveillance and Reconnaissance (JFCC-ISR).” Sponsor: DIA. Funding: \$121,840. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Thal, A., Weir, J. D., and Mayer, G., "Strategic R&D Project Selection Using Decision Analysis", Industrial Engineers Research Conference Jun 2010, Cancun Mexico. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Jeong, G., Hall, S. and Weir, J.D., "A Multi-Objective Approach to a Bipartite Assignment Matching Problem Using Weighted Values from Multiple Constraints,” 78th Military Operations Research Society Symposium 2010. [COA]

Gutman A., and Weir, J.D., "Triage Method: A Multiobjective Decision Analysis (MODA) Technique for Continuous Decision Support,” 78th Military Operations Research Society Symposium 2010. [COA]

Gutman A., and Weir, J.D., "The Random Sampling of Vectors in a Bounded Region via Monte Carlo Simulation,” 78th Military Operations Research Society Symposium 2010. [COA]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Sanders, M., Gutman, A. and Weir, J.D., "Risk Profiles and Rank Sensitivity in the Selection of a Course of Action in Stability Operations", INFORMS Annual Meeting Nov 2009, Invited speaker, Joint Session, Decision Analysis Society and Military Applications Society. [COA]

6.6. CENTER FOR SYSTEMS ENGINEERING

Center for Systems Engineering

Education and Training Division

Homepage: <http://cse.afit.edu/>

Chief 937-255-3355 x3363

Fax 937-255-4981

FACULTY RESEARCH OUTPUT

*Faculty Bios can be found under their respective department listings.

JACQUES, DAVID R., Department of Systems and Engineering Management

SPONSOR FUNDED RESEARCH PROJECTS

“Building Education and Workforce Capacity in Systems Engineering.” Sponsor: OSD. Funding: \$600,000. [CSE]

SONI, SOM R., Department of Systems and Engineering Management

SPONSOR FUNDED RESEARCH PROJECTS

“Automated Approaches for System Engineering Innovation in S&T Lab Environment.” Sponsor: DAGSI. Funding: \$20,160. [CSE]

APPENDICES

APPENDIX A: POST-DOCTORAL AND OTHER RESEARCH ASSOCIATES CREDENTIALS

LEAKEAS, CHARLES L., Research Associate, Department of Engineering Physics, Center for Directed Energy, AFIT Appointment Date: 2009 (AFIT/ENP); BS, Mechanical Engineering, Purdue University, 1988; MS, Applied Mathematics, Purdue University, 1992; PhD, Engineering Science and Mechanics, University of Alabama, 2001. Dr. Leakeas' scope of work includes wave-optics simulations, high performance computing, and phased array lasers. Tel. 937-255-3636 x4688 (DSN 785-6565 x4688), email: Charles.Leakeas@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

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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.

711 HPW/RH	AFRL 711 th Human Performance Wing Human Effectiveness Directorate
ACC	Air Combat Command
ACES	Applied Computational Electromagnetic Society
AEDC	Arnold Engineering Development Center
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
AFGLSC	Air Force Global Logistics Support Center
AFIT	Air Force Institute of Technology
AFMC	Air Force Materiel Command
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
AFSEO	Air Force Seek Eagle Office (46 SK/SKE)
AFSOC	Air Force Special Operations Command
AFSPC	Air Force Space Command
AFTPS	Air Force Test Pilot School
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
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
DHS	Department of Homeland Security
DOD	Department of Defense
DOE	Department of Energy
DTRA	Defense Threat Reduction Agency
GPSW	Global Positioning Systems Wing
HELJTO	High Energy Laser Joint Technology Office
IEEE	Institute of Electrical and Electronics Engineers
INCOSE	International Council on Systems Engineering
ISSMO	International Society for Structural and Multidisciplinary Optimization
JIEDDO	Joint Improvised Explosive Device Defeat Organization
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
ORS	Operationally Responsive Space Office
OSD	Office of the Secretary of Defense
ROKA	Republic of Korea Army
SAE	Society of Automotive Engineers
SAF	Office of the Secretary of the Air Force
SDTW	Space Development and Test Wing
SMC	Space and Missiles Center
SPIE	The International Society for Optical Engineering
USAARL	United States Army Aeromedical Research Laboratory
USAF	United States Air Force
USAFSAM	United States Air Force School of Aerospace Medicine
USCENTCOM	United States Central Command
USSTRATCOM	United States Strategic Command
USTRANSCOM	United States Transportation Command
WPAFB	Wright-Patterson Air Force Base

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