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# **Air Force Institute of Technology**

## **Research Report 2012**

Period of Report: 1 October 2011 to 30 September 2012

Graduate School of Engineering and Management

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

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# **AIR FORCE INSTITUTE OF TECHNOLOGY**

Wright-Patterson Air Force Base, Ohio

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

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



## **Air Force Institute of Technology Research Report 2012 Foreword**

Research programs at the Air Force Institute of Technology (AFIT) are an integral component of our research-based 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, Center for Technical Intelligence Studies and Research, Center for Space Research and Assurance 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 FY12 research statistics and contributions of the Graduate School of Engineering and Management (EN) at AFIT. AFIT research interests and faculty expertise cover a broad spectrum of technical areas related to USAF needs, as reflected by the range of topics addressed in the faculty and student publications listed in this report. In most cases, the research work reported herein is directly sponsored by one or more USAF or DOD agencies.

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

Additional information on the research programs at AFIT may also be found on the research web home page at <http://www.afit.edu/en/enr/>. The Office of Research and Sponsored Programs, Graduate School of Engineering and Management can be reached at 937-255-3633, (DSN 785-3633) or by email: [research@afit.edu](mailto:research@afit.edu). The primary points of contact are Dr. Michael J. Caylor, Director of Sponsored Programs, 937-255-3636 x7104, DSN 785-3636 x7104 and Dr. Heidi R. Ries, Dean for Research, 937-255-3636 x4544, DSN 785-3636 x4544.

## 1.2. THE GRADUATE SCHOOL OF ENGINEERING AND MANAGEMENT RESEARCH COLLABORATION

As detailed in the 2012-2013 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 Aeronautics and Astronautics (ENY), the Department of Electrical and Computer Engineering (ENG), the Department of Engineering Physics (ENP), the Department of Mathematics and Statistics (ENC), the Department of Operational Sciences (ENS), and the Department of Systems and Engineering Management (ENV). In all of these disciplines, research is an integral component of graduate education, developing an individual student's skills and providing new knowledge of interest to many.

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

The [Department of Aeronautics and Astronautics](#) 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** and the **Center for Cyberspace Research**. 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** and **Center for Technical Intelligence Studies and Research**. The following list highlights the Department's research specialties within these programs:

**Adaptive Optics, Aero-Optics and Beam Control**  
**Atmospheric Characterization and Compensation**  
**Atmospheric Effects on Weapons Systems**  
**Aviation Weather Forecasting**  
**Biological Chemical Weapon Technologies**  
**Computational Physics**  
**Defects in Crystalline Solids**  
**Directed Energy Weapons Effectiveness**  
**Effects of Nuclear Weapons**  
**Fallout Analysis**  
**Imaging Science**  
**Lasers and Electro-Optics**  
**Lightening Detection**

**Materials – Bio, Nuclear and Sensor**  
**Modeling and Simulation of Atmospheric Effects**  
**Molecular Reactive Dynamics**  
**Nanomaterials**  
**Nuclear Forensics**  
**Nuclear Survivability**  
**Physics-Based Scene Modeling**  
**Radiation and Particle Detection**  
**Radiation Effects on Materials and Electronics**  
**Radiation Transport**  
**Remote Sensing and Signature Analysis**  
**Semiconductors**

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

**Acoustic Wave Scattering**  
**Bayesian Analysis**  
**Biostatistics**  
**Categorical Data Analysis**  
**Design of Experiments**  
**Electromagnetics**  
**Functional Analysis**  
**Information Fusion**

**Nonlinear Waves**  
**Numerical Analysis**  
**Optimization**  
**Partial Differential Equations**  
**Rarefield Gas Dynamics**  
**Regression Modeling**  
**Stochastic Processes**  
**Wavelets**



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

**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**

Additionally, the **OSD Scientific Test and Analysis Techniques in Test & Evaluation Center of Excellence** directly supports acquisitions programs by using research results from the **Center for Operational Analysis** and capturing relevant research topics in the areas of :

**Design and Analysis of Experiments**  
**Design for Reliability**  
**Modeling and Simulation**

**Reliability Growth**  
**Response Surface Methods**  
**Test and Evaluation Techniques**

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**  
**Knowledge Management**  
**Occupational/Environmental Exposures**  
**Organizational Change**  
**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 Chapter 6) or visit <http://www.afit.edu/research.cfm> for further information.

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

The [Center for 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 Technical Intelligence Studies and Research \(CTISR\)](#) is focused on Air Force, Department of Defense and the U.S. Intelligence Community (IC)'s scientific, technical and operational activities through graduate research programs. Activities include remote sensing technologies, signature and algorithm development for target detection, clarification, and tracking, and advanced biometrics for force protection. CTISR is also a national resource for educating a new generation of intelligence professionals through the Advanced Geospatial Intelligence (AGI) graduate certificate program. This center was renamed from the Center for MASINT Studies and Research (CMSR) to the present name effective 1 July 2011.

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 **Center for Space Research and Assurance (CSRA)** is focused on delivering highly-valued resilient, responsive and reliable space capabilities to the DOD and Intelligence Community through executing cutting-edge space technology development, science and space experiments in collaboration with government organizations to meet the challenges of tomorrow by developing the technical space cadre through world-class research and immersive hands-on graduate education. The CSRA was established Nov 2012. The FY13 Research Report will document initial CSRA activity.

## 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.

**Grimaila, Michael R.**, Associate Professor of Systems Engineering, Department of Systems and Engineering Management, Fellow of the Information System Security Association.

**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**, Distinguished 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**, Distinguished 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 Operations Research, Department of Operational Sciences, Fellow of the American Society for Quality.

**Raquet, John F.**, Associate Professor of Electrical Engineering, Department of Electrical and Computer Engineering, Fellow of the Institute of Navigation.

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

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

**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 for Quality, Fellow of the Institute for Operations Research and Management.

**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., Lt Col**, Level 3 Space Professional

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

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

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

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

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

**Bunker, David J.**, APDP Level III Certification – SPRDE

**Bunker, David J.**, APDP Level II Certification – Program Management

**Bunker, David J.**, APDP Level I Certification – Test and Evaluation

**Butts, Jonathan W., Maj**, Certified Information Systems Security Professional (CISSP)

**Butts, Jonathan W., Maj**, EC-Council Certified Ethical Hacker (CEH)

**Butts, Jonathan W., Maj**, Global Information Assurance Certification (GIAC) Security Essentials

**Butts, Jonathan W., Maj**, National Security Agency Certificate for INFOSEC Professionals

**Butts, Jonathan W., Maj**, National Security Agency Certificate for Senior Systems Managers

**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)

**Dube, Thomas E., Maj**, Certified Information Systems Security Professional (CISSP)

**Dube, Thomas E., Maj**, EC-Council Certified Security Analyst (ECSA)

**Feng, Peter P., Lt Col**, Professional Engineer, State of Nevada

**Feng, Peter P., Lt Col**, Professional Engineer, State of North Carolina

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

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

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

**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)<sup>2</sup>; Vienna, VA

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

**Harper, Willie F.**, Professional Engineer, State of Arizona

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

**Johannes, Tay W., Lt Col**, Professional Engineer, State of Montana

**Kowash, Benjamin R., Maj**, Professional Engineer, Nuclear Engineering, State of Michigan

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

**Ladd, Darin A., Lt Col**, APDP Level II, Program Management

**Ladd, Darin A., Lt Col**, Six Sigma Green Belt

**Ladd, Darin A., Lt Col**, APDP Level I, Communications-Computer Systems

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

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

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

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

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

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

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

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

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

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

**Racz, LeeAnn, Maj**, Professional Engineer, State of Colorado

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

**Robinson, David J., Lt Col**, Certified Information Systems Security Professional (CISSP)

**Rutledge, James L., Capt**, Professional Engineer, State of Texas

**Shelley, Michael L.**, Certified Air Force Hearing Conservationist

**Sitzabee, William E., Lt Col**, Certified Geographical Information Science Professional

**Sitzabee, William E., Lt Col**, Professional Engineer, State of North Carolina

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

**Tuttle, Ronald F.**, APDP Level III Certification – Program Management

**Tuttle, Ronald F.**, APDP Level III Certification – SPRDE

**Walli, Karl C., Lt Col**, APDP Level III Certification – SPRDE

**Walli, Karl C., Lt Col**, Space Professional Level III Certification

**Walli, Karl C., Lt Col**, NRO Program Management Level III Certification

**Weidner, John W., LTC**, Professional Engineer, State of Wisconsin

**Wirthlin, Joseph R., Lt Col**, Certified Systems Engineering Professional (CSEP)

**Wirthlin, Joseph R., Lt Col**, APDP SPRDTE Level III Certification

**Wirthlin, Joseph R., Lt Col**, NRO Systems Engineering Certification, Level III

**Wirthlin, Joseph R., Lt Col**, APDP Program Management Level II

**Wirthlin, Joseph R., Lt Col**, AFSO21 Green Belt

**Yamamoto, Dirk P., Lt Col**, Board Certified Industrial Hygienist

**Yamamoto, Dirk P., Lt Col**, Diplomate-American Academy of Industrial Hygienists

**Yamamoto, Dirk P., Lt Col**, Professional Engineer, State of Minnesota

\*Emeritus faculty

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

### **2.3.1. FACULTY**

#### **AKERS, BENJAMIN F.,**

ENC Instructor of the Quarter, 2011 Fall Quarter.

ENC Instructor of the Quarter, 2012 Spring Quarter.

SOCHE Faculty Excellence in Teaching Award (2012).

#### **BAILEY, WILLIAM F.**

2012 Science, Technology, Engineering and Mathematics (STEM) Award for AF Outstanding Science and Engineering Educator.

#### **BUTTS, JONATHAN W., Maj**

Mr. Lopez, Maj Butts and Capt Larkin, won 1st place on their poster entitled "Evaluation of Traditional Security Solutions in the SCADA Environment" at the ICIW-2012 Conference.

#### **COLLINS, PETER J.**

Glauvitz, Coutu, Collins and Starman receive Best Paper Award, 13th International Symposium on MEMS and Nanotechnology, Society of Experimental Mechanics (SEM) Annual Conference, 2012.

#### **COUTU, RONALD A.**

IDEA Award, US Patent 7,906,738, "Shaped MEMS Contact (process)," 2012.

Glauvitz, Coutu, Collins and Starman receive Best Paper Award, 13th International Symposium on MEMS and Nanotechnology, Society of Experimental Mechanics (SEM) Annual Conference, 2012.

#### **DUBE, THOMAS E., Maj**

Awarded the Stanley N. Roscoe Award sponsored by the Aerospace Human Factor's Association, 2012.

#### **ERICH, ROGER A., Capt**

ENC Instructor of the Quarter, 2012 Summer Quarter.

#### **FICKUS, MATTHEW C.**

2011 Air Education and Training Command Civilian Educator of the Year.

#### **FISHER, KENNETH A., Lt Col**

Received the Outstanding Military Professor Award, sponsored by the Military Officers Association of America and is given to recognize the military professor who has demonstrated excellence in teaching, research, and service.

#### **FRIEND, MARK A., Lt Col**

Recognized as an *Ohio Magazine* "Excellence in Education" Honoree, November 2011.



Winner of the 2012 Southwestern Ohio Council for Higher Education (SOCHE) Faculty Excellence Award.

**GRIMAILA, MICHAEL R.**

2012 Colonel Charles Stone Award, AFIT Board of Visitors.

2012 Researcher of the Year, Department of Systems and Engineering Management.

**GROSS, KEVIN C.**

2012 Southwestern Ohio Council for Higher Education (SOCHE) Award for Excellence in Teaching.

Best Paper Award at the 9th International Symposium on Special Topics in Chemical Propulsion (9-ISICP) in Québec City (9-13 July 2012) for “Imaging Fourier-transform Spectrometry for Plume Diagnostics and Code Validation.”

**HAVRILLA, MICHAEL J.**

Honorable Mention – Air Force, John L. McLucas Basic Research Award, July 2012.

**JACKSON, JULIE A.**

Air Force Winner – Air Force Junior Civilian Scientist/Engineer Award 2012.

**KOWASH, BENJAMIN R., Maj**

Professor Ezra Kotcher Award, Wright Memorial Chapter, Air Force Association.

**MILLER, JOHN O.**

Department of Operational Sciences Faculty of the Quarter, Fall 2011 (student nominated award).

**MILLER, MICHAEL E.**

2012 Industrial and Systems Research Conference, Best Paper Award: Engineering Economy Track.

**MULLINS, BARRY E.**

Cage H. Crocker Outstanding Professor Award for CY2011, awarded by AFIT Board of Visitors.

John A. Curtis Lecture Award from the Computers in Education Division, American Society for Engineering Education (ASEE) Annual Conference; Best paper and presentation-#1 of 68.

2011 International Information Systems Security Certification Consortium, Inc., (ISC)<sup>2</sup> U.S. Government Information.

Best Paper (#1 of 58) in the Computers in Education Division at the 2012 American Society for Engineering Education (ASEE) Conference in San Antonio Texas. He presented his paper “Developing Cyber Warriors from Computer Engineers et al.” at the “Best of Computers in Education Division” session.

**POLANKA, MARC D.**

Faculty Excellence Award for Teaching, SOCHE, 2012.

AIAA Special Service Citation, 2012.

**RACZ, LEEANN, Maj**

2012 Scholar of the Year, Department of Systems and Engineering Management.

2012 Faculty Excellence in Teaching Award, Southern Ohio Council for Higher Education.

**RAQUET, JOHN F.**

General Bernard A. Schriever Award; Awarded in recognition of an individual who advances aerospace power, technology, doctrine, or the Air Force as a profession (June 2012).

**REEDER, MARK F.**

Letter of commendation from AFRL/RB for work in the Trisonic Gas Facility (December 2011).

**SANDLIN, DORAL E., Lt Col**

2011-2012 Instructor of the Year Awarded by the Advanced Study in Air Mobility Class of 2012, Joint Base McGuire-Dix-Lakehurst, New Jersey.

**SCHULTZ, KENNETH L.**

Department of Operational Sciences Faculty of the Quarter, Winter 2012 (student nominated award).

**WEIR, JEFFERY D.**

Department of Operational Sciences Faculty of the Quarter, Summer 2011 (student nominated award, announced 19 Dec 2011).

**WHITE, EDWARD D., III**

ENC Instructor of the Quarter, 2012 Winter Quarter.

Dr. Leslie M. Norton Teaching Excellence Award, 2012.

### **2.3.2. STUDENTS**

#### **BENTLEY, BROOK I.**

Best Paper in Session, Directed Energy Professional Society Symposium, April 2012.

#### **BEVINS, JAMES**

IEEE Nuclear and Plasma Physics Society Graduate Scholarship Award for his AFIT thesis research.

#### **BURLEY, JARRED L.**

Air Force Institute of Technology Louis F. Polk Award, March 2012.

#### **DIEHL, DANIEL C.**

June 2012 Mervin E. Gross Award for demonstrating the most exceptional academic achievement and high qualities of character, initiative, and leadership by a graduating student.

#### **DRYLIE, SCOTT T.**

2012 Dean's Award for the most exceptional master's thesis by a graduating student in the Department of Systems Engineering and Management. Thesis title: "Predictors and Predictive Effects of Attitudinal Inconsistency Towards Organizational Change."

#### **EKHOLM, JARED M.**

Advanced Technical Intelligence Association (ATIA) Association Outstanding Student Award, March 2012.

#### **ENGLERT, JOHN**

Meritorious Conference Paper and Presentation for "Estimating Peak EMP Magnetic Fields Using Alternating Field Demagnetization," presented at the Hardened Electronics and Radiation Technology (HEART) Conference, March 2012, Monterey, CA.

#### **FITZGERALD, JACK G.**

2012 Dean's Award for the most exceptional master's thesis by a graduating student in the Department of Engineering Physics. Thesis title: "A Programmable Liquid Collimator for Both Coded Aperture Adaptive Imaging and Multiplexed Compton Scatter Tomography."

2012 Commandant's Award for the most exceptional master's thesis by a graduating student in the Department of Engineering Physics. Thesis title: "A Programmable Liquid Collimator for Both Coded Aperture Adaptive Imaging and Multiplexed Compton Scatter Tomography."

#### **FINDLEY, JONATHAN S.**

March 2012 Mervin E. Gross Award for demonstrating the most exceptional academic achievement and high qualities of character, initiative, and leadership by a graduating student.

#### **FLORA, THOMAS J.**

Dayton-Cincinnati Aerospace Sciences Symposium Best Presentation Award, 2012.

**FRANZ, TIM**

Graduate School's Department of Electrical and Computer Engineering alumni (MS-Graduate Cyberspace Operations program) and a Cyber 300 graduate was selected as one of three winners of the Ira C. Eaker Award for the top Air and Space Power Journal article of the past year. The award winning paper was titled "The Cyber Warfare Professional: Realizations for Developing the Next Generation" and was written as part of the Cyber 300 course requirements.

**GLASSBURNER, AARON V.**

March 2012 Jerome G. Peppers, Jr. Outstanding Student Award, International Society of Logistics (SOLE) award for his academic record and contributions to the field of logistics. Thesis title: "Evaluation of Inventory Reduction Strategies: Balad Air Base Simulation Case Study."

**GLAUVITZ, NATHAN E.**

Glauvitz, Coutu, Collins and Starman receive Best Paper Award, 13th International Symposium on MEMS and Nanotechnology, Society of Experimental Mechanics (SEM) Annual Conference, 2012.

**GUTIERREZ DEL ARROYO, JOSE**

Third Place – Student Paper Competition - J. Gutierrez del Arroyo and J. A. Jackson, "Range Profiles from an Experimental OFDM Passive Radar," 2012 International Waveform Diversity and Design Conference, Kauai, Hawaii, January 2012.

**HAMMOND, GLENN B., II**

Awarded the MASINT Committee Award for Academic Excellence. Thesis title: "Target Classification of Canonical Scatterers Using Classifical Estimation and Dictionary Based Techniques."

**HANSON, COLIN Q.**

Dayton-Cincinnati Aerospace Sciences Symposium Best Presentation Award in Fluid Dynamics and Aeroelasticity, 2012.

**HARNLY, MARIE T.**

2012 Dimitroff Outstanding Student Thesis Award.

**HOLLENBECK, ALEX C.**

2012 Dean's Award for the most exceptional master's thesis by a graduating student in the Department of Aeronautics and Astronautics. Thesis title: "Evaluation of the Thorax Manduca Sexta for Flapping Wing Micro Air Vehicle Applications."

**KINNE, JEREMY P.**

2012 Society of American Military Engineers Engineering Management Student Leadership Award.

**JURADO, JUAN**

Received the AFIT Navigation Research Excellence Award, Sponsored by the Dayton section of the Institute of Navigation, which is awarded for the master's thesis reflecting the most exceptional research contribution to scientific or engineering knowledge in the navigation area.

2012 Dean's Award for the most exceptional master's thesis by a graduating student from the Department of Electrical and Computer Engineering. Thesis title: "Enhanced Image-Aided Navigation Algorithm with Automatic Calibration and Affine Distortion Prediction."

**LANE, CORY T.**

Air Force Institute of Technology Lt Edwin E. Aldrin Leadership Award, March 2012.

**LARKIN, ROBERT D.**

Mr. Lopez, Maj Butts and Capt Larkin, won 1st place on their poster entitled "Evaluation of Traditional Security Solutions in the SCADA Environment" at the ICIW-2012 Conference.

**LU, QUAN-HAI T.**

American Nuclear Society (ANS) Thesis Award, March 2012.

**LYNCH, SARAH R.**

June 2012 Air Force Historical Association Bryce E. Poe II Award for the thesis or graduate research project providing the most significant contribution to an understanding of the historical factors affecting an Air Force or Department of Defense problem, event or process. GRP Title: "RPA Performing the Air-Refueling Mission."

**MCNABB, MARCUS E.**

2011 Air Force Company Grade Lessons Learned Military Professional of the Year, awarded by the Analytical Community at the annual Air Force Analysis/Lessons Learned (A2L2) Awards Ceremony, 23 Oct 2011.

**MCPHERSON, ANDREW W.E.**

2012 Dean's Award for the most exceptional master's thesis by a graduating student in the Department of Systems and Engineering Management. Thesis title: "Optimization of Nanoscale Zero-Valent Iron for the Remediation of Groundwater Contaminants."

**MIDDLETON, CHARLES J.**

June 2012 Louis F. Polk Award sponsored by the National Defense Industrial Association (NDIA), awarded in recognition of the student who has made an advanced contribution in their professional field in direct furtherance of the objectives of NDIA. GPR title: "Risk Assessment Planning for Airborne Systems: An Information Assurance Failure Mode, Effects and Criticality Analysis Methodology."

**MILLER, KARI A.**

March 2012 Secretary James G. Roche Award honoring the graduating enlisted student who best demonstrates academic, leadership, research, and service achievements.

**MORRIS, JAMES F.**

2011 winner of the Seth Bonder Scholarship for Applied Operations Research in Military Applications from the Military Applications Society of the Institute for Operations Research and the Management Sciences (INFORMS) for his dissertation effort entitled "Vetting Dark Networks." The scholarship recognizes development and application of process modeling and operations research analysis to military issues, Nov 2011.

**OBERSON, FREDRIC M.**

June 2012 Jerome G. Peppers, Jr. Outstanding Student Award, International Society of Logistics (SOLE) award for his academic record and contributions to the field of logistics. GRP Title: "Analysis of CENTCOM Commercial Intra-Theater Airlift Costs."

**SAIE, CADE M.**

March 2012 Military Operations Research Society (MORS) award for the graduate thesis or graduate research project judged to demonstrate the best application of operations research methodology or theory development to a military problem. Thesis title: "Understanding the Instruments of National Power through a System of Differential Equations in a Counterinsurgency."

**STEINBOCK, MICHAEL J.**

Presented paper and received scholarship at annual SPIE Optics and Photonics Conference in California.

**SMITH, LINDSAY N.**

2012 Dean's Award for the most exceptional master's thesis by a graduating student in the Department of Mathematics and Statistics. Thesis title: "Determining Angular Frequency from Video with a Generalized Fast Fourier Transform."

**STORM, SCOTT M.**

2012 Dean's Award for the most exceptional master's thesis by a graduating student in the Department of Operational Sciences. Thesis title: "Evaluating Aerial Refueling Simulator Validation Test Designs by Extending Response Surface Methodology to Analyze Time History Responses."

**VAIRA, BRADY J.**

June 2012 Military Operations Research Society (MORS) award for the graduate thesis or graduate research project judged to demonstrate the best application of operations research methodology or theory development to a military problem. GRP Title: "Estimating Bird/ Aircraft Collision Probabilities and Risk Utilizing Spatial Poisson Processes."

**2.3.3. STAFF****LOPEZ, JUAN, Ctr**

Selected by the Governor's Ohio Latino Affairs Commission as a Distinguished Hispanic Ohioan for exemplary achievements and contributions to the Hispanic community.

Mr. Lopez, Maj Butts and Capt Larkin, won 1st place on their poster entitled "Evaluation of Traditional Security Solutions in the SCADA Environment" at the ICIW-2012 Conference.

**2.3.4. TEAMS****AIAA CHAPTER**

AIAA Outstanding Section Award, Very Large Category, 1st Place, 2012.

## **ANT CENTER**

Award for the ANT Center being honored as a “Pioneer in Precision Navigation” and being made a Jimmy Doolittle Educational Fellow of the Air Force Association, AFA Symposium in Orlando, FL.

## **CCR CYBER 200/300 TEAM**

Selected as the winner of the 2011 Government Information Security Leadership Award (GISLA) for demonstrated leadership in advancing and improving the information security workforce. The award is given by the International Information Systems Security Certification Consortium, Inc., the world's largest not-for-profit information security professional body.

Certificate of Special U.S. Congressional Recognition presented to AFIT's Center for Cyberspace Research - Cyber 200/300 Professional Continuing Education Team.

## **DELTA XI CHAPTER**

AFIT's Delta Xi chapter of the Eta Kappa Nu Electrical and Computer Engineering Honor Society Outstanding Chapter Award 2010-2011. Designated an “Outstanding Chapter” by the national organization. Chapters were judges on their activities of service to others during academic year 2010-2011. An award plaque was presented at the Electrical and Computer Engineering Department Head's Association's annual meeting in March at the University of Texas at Austin.

### 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 2012 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 57 questionnaires returned out of the 285 questionnaires mailed.

**Table 3.1 Sponsor Assessment of AFIT Research**

QUESTION	RESULTS
Did this research contribute to a current Air Force/DOD project? (Yes answers)	96%
The thesis work was: Highly significant Significant Slightly significant Not significant	33% 56% 9% 0%
Average man-years of effort saved by the sponsors.	0.859
Average cost avoided per thesis/dissertation by the sponsors.	\$116,659
Total cost avoided for all theses and dissertations sponsored (estimated).	\$33M
Rank of respondents* Brig Gen (SES) Col (DR-IV/GS-15) Lt Col (DR-III/GS-14) Major (DR-II/GS-13) Capt (DR-I/GS-12)  *Of the 57 returned questionnaires, 7 respondents did not list Rank/GS levels. These percentages represent only those which responded.	7% 30% 30% 16% 4%





## 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. Please describe how this thesis impacted your area of responsibility, or provide other comments you would like to make. (For example, have particular changes been made or planned as a result of this work? What was/will be the impact of the changes?) All comments will be shared with the faculty advisor, the academic department, and AFIT administrators as appropriate.

You may mail this to AFIT/ENR, 2950 Hobson Way, Wright-Patterson AFB OH 45433-7765, or fax it to (937) 656-7139 (DSN 785-7139), or just e-mail your answers (only) to 1 to 5 to [research@afit.edu](mailto:research@afit.edu).

If you use e-mail, please include the designator above so that we might identify the project.

Thank you.

\_\_\_\_\_  
Name of Evaluator

\_\_\_\_\_  
Office Symbol

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

### 3.2. RESEARCH AND CONSULTING OUTPUT MEASURES

There are measurable indicators of AFIT's contribution to the engineering and scientific community and AFIT's success in staying well informed of technical possibilities and scientific opportunities. These indicators include the number and quality of technical publications accepted by the editors of journals; the number of presentations accepted for regional, national and international conferences; the number of sponsor funded research projects conducted; and finally, the number of student Graduate Research Papers, MS theses, and PhD dissertations completed and submitted to the Defense Technical Information Center. For FY12, these output measures are shown in Tables 3.2a and 3.2b for the Departments and Centers, respectively.

**Table 3.2a Faculty Research and Sponsored Programs Output, by 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)*	137	17	38	21	17	24	20
Refereed Publication Authorships***	239	33	62	35	44	35	30
Refereed Conferences on the Basis of Full Paper Review***	124	5	56	23	21	6	13
Refereed Conferences on the Basis of Abstract Review***	207	12	45	35	11	44	60
Sponsor Funded Projects**	198	13	62	43	13	14	51
Books & Chapters of Books***	20	4	10	-	1	5	-
Patents	11	-	3	-	-	8	-
Doctoral Dissertations Advised	34	1	10	4	7	1	11
Master's Theses Advised	300	8	91	25	55	60	61
Graduate Research Papers Advised	35	-	3	-	26	6	-

\*FTE: Full-time equivalent

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

\*\*\*Publications/Presentations are counted by faculty authorships

**Table 3.2b Faculty Research and Sponsored Programs Output, by Center**

	Graduate School, by Center					
	Center Total	ANT	CCR	CDE	CTISR	COA
Number of Affiliated Faculty	96	27	22	12	11	24
Refereed Publication Authorships*	93	15	26	3	8	41
Refereed Conferences on the Basis of Full Paper Review*	46	9	16	-	-	21
Refereed Conferences on the Basis of Abstract Review*	69	26	2	24	6	11
Sponsor Funded Projects	71	20	13	18	8	12
Books & Chapters of Books*	9	3	6	-	-	-
Patents	3	3	-	-	-	-
Doctoral Dissertations Advised	15	3	3	2	1	6
Master's Theses Advised	126	23	40	10	2	51
Graduate Research Papers Advised	24	-	3	-	-	21

\*Publications/Presentations are counted by faculty authorships

### 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 all theses, dissertations, and graduate research papers listed in Table 3.2a are externally sponsored by Air Force, DOD and Government agencies. In addition, most of the research projects and consultations are carried out for Air Force and DOD units. The data are summarized in Figure 3.1 and Table 3.3.

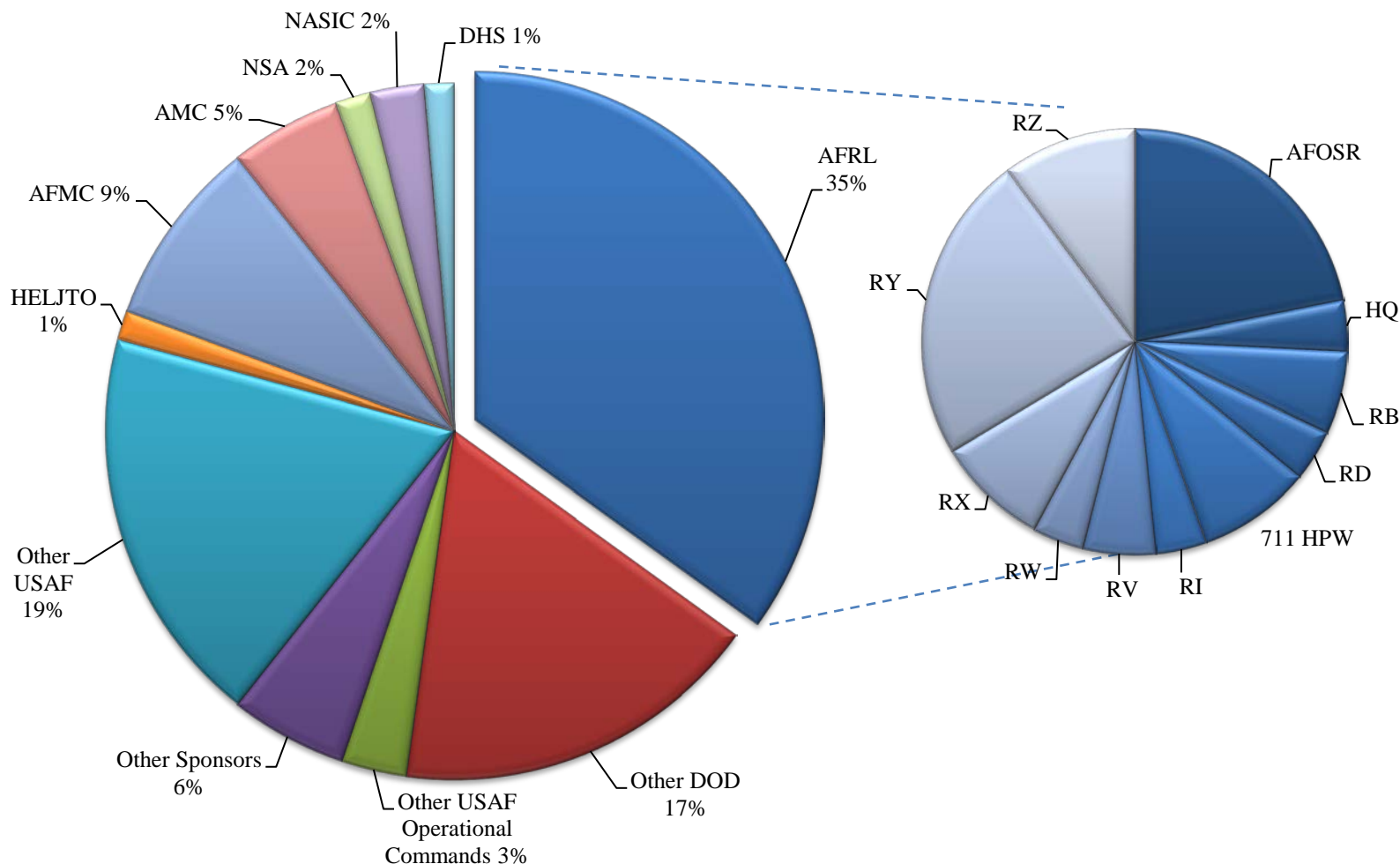


Figure 3.1 Sponsors of AFIT Theses, Dissertations, and Graduate Research

**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	2	1
HQ UNITED STATES AIR FORCE		2	3	2
AIR COMBAT COMMAND		3	2	
AIR EDUCATION AND TRAINING COMMAND		2		
AIR FORCE MATERIEL COMMAND		13	3	5
Aeronautical Systems Center		6	2	3
Air Force Global Logistics Support Center	1	1		1
Air Force Life Cycle Management Center			1	
Air Force Nuclear Weapons Center		2		2
Air Force Research Laboratory (AFRL)		1		2
Air Force Office of Scientific Research (AFOSR)	5	23		36
Air Vehicles Directorate (RB)	3	7		7
Directed Energy Directorate (RD)	1	4		4
711 Human Performance Wing		11		3
Information Directorate (RI)		5		4
Materials & Manufacturing Directorate (RX)	1	10		7
Munitions Directorate (RW)	1	4		2
Propulsion Directorate (RZ)	3	12		4
Sensors Directorate (RY)	5	25		27
Space Vehicles Directorate (RV)		7		7
Air Force Seek Eagle Office		2		
Air Force Test Pilot School		1		
AIR MOBILITY COMMAND		6	13	1
AIR FORCE SPACE COMMAND		1	1	1
Space and Missile Systems Center		1	1	
USAF FIELD OPERATING AGENCIES/DIRECT REPORTING UNITS		6	2	
Air Force Technical Application Center				1
Air Force Medical Support Agency		2		1
National Air and Space Intelligence Center	3	6		6
US Air Force Academy		1		
OTHER DEPARTMENT OF DEFENSE	4	30		14
Defense Threat Reduction Agency		1		4
Defense Advanced Research Projects Agency		2		3
High Energy Laser Joint Technology Office	1	4		8
National Security Agency	1	5		5
Office of the Secretary of Defense	1	9		6
Operationally Responsive Space Office				3
United States Army		3	1	2
United States Navy		2		6
US Pacific Command		1		
US Strategic Command	1	3		3
US Transportation Command	2	2	1	1
OTHER FEDERAL AGENCIES				
Department of Energy		2		4
Department of Homeland Security		5		1
Environmental Protection Agency		1		1
National Aeronautics and Space Administration		3		
National Science Foundation				4
US Department of Transportation				1
NON-FEDERAL AGENCIES		14		3
Dayton Area Graduate Studies Institute				2
<b>*TOTALS</b>	<b>33</b>	<b>252</b>	<b>32</b>	<b>198</b>

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

### 3.4. EXTERNAL SPONSOR FUNDING FOR THE GRADUATE SCHOOL OF ENGINEERING AND MANAGEMENT

Many of the Graduate School of Engineering and Management's theses and research projects completed under faculty supervision (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 external funding for FY12, and Figure 3.2 summarizes the past ten fiscal years of sponsored funding.

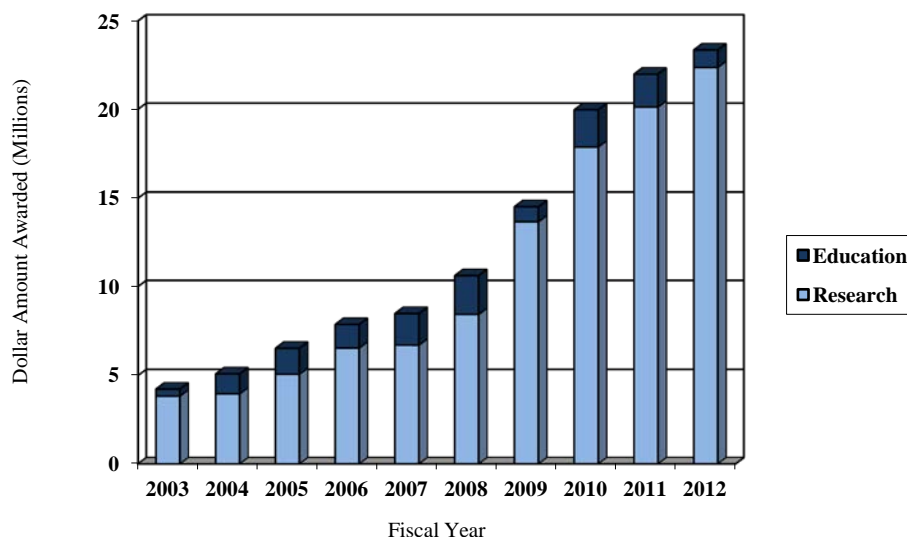
**Table 3.4 FY12 External Funding & Research Expenditures for Academic Departments & Research Centers (\$1,000's)**

Department	Newly Awarded Research Projects		Newly Awarded Education Projects		Total FY12 Newly Awarded Projects		Total FY12 Research Expenditures
	#	\$k	#	\$k	#	\$k	\$k
Mathematics & Statistics (ENC)	13	587	-	-	13	587	562
Electrical & Computer Eng (ENG)	59	6,044	3	844	62	6,888	8,348
Engineering Physics (ENP)	41	5,177	2	64	43	5,242	6,151
Research & Sponsored Programs (ENR)	1	19	1	36	2	55	17
Operational Sciences (ENS)	13	6,089	-	-	13	6,089	5,250
Systems & Eng Management (ENV)	14	1,019	-	-	14	1,019	1,547
Aeronautical & Astronautical Eng (ENY)	49	3,433	2	40	51	3,473	5,180
<b>TOTAL</b>	<b>190</b>	<b>22,369</b>	<b>8</b>	<b>984</b>	<b>198</b>	<b>23,353</b>	<b>27,055</b>

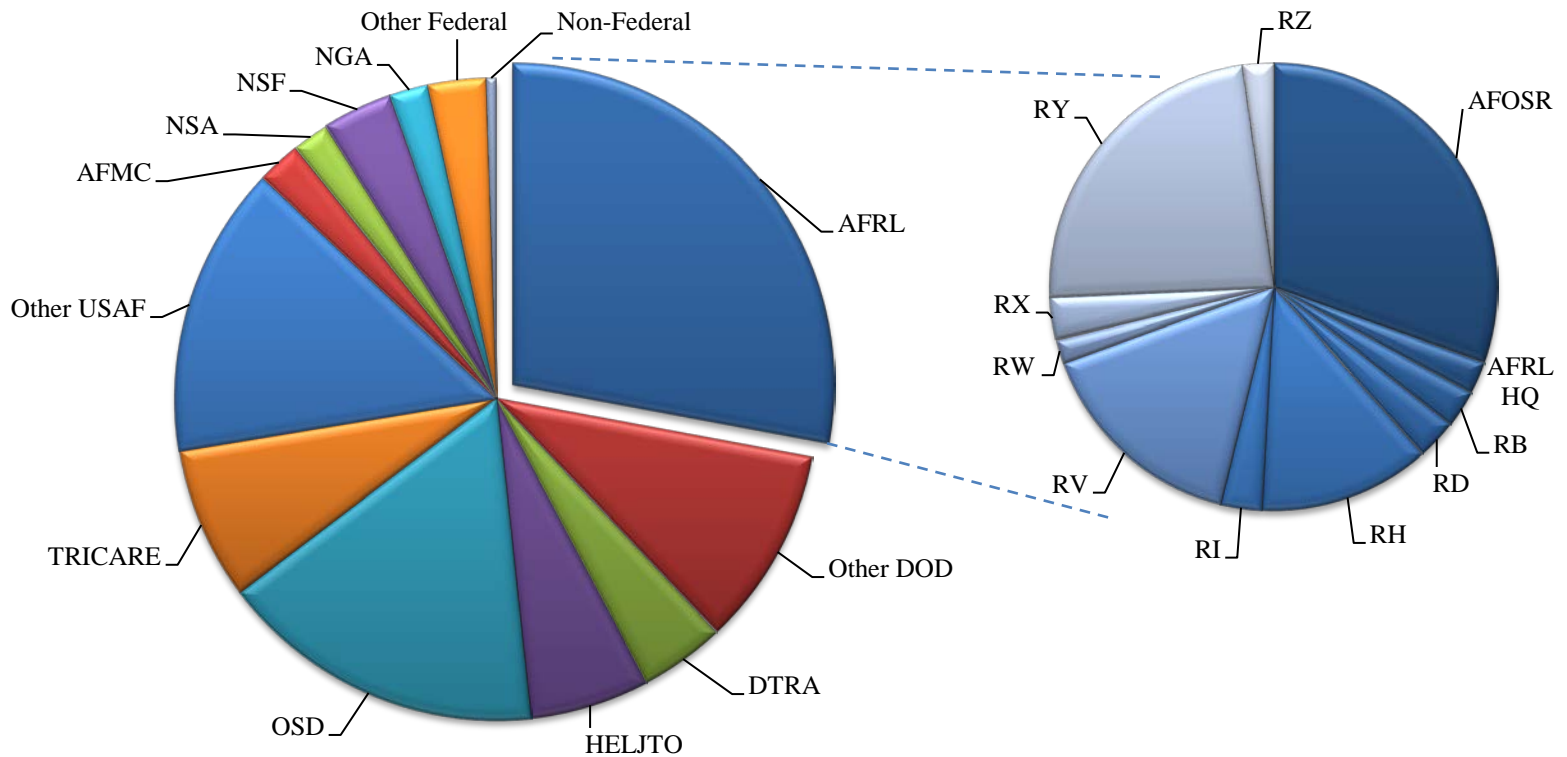
Center							
Advanced Navigation Technology (ANT)	20	1,214	-	-	20	1,214	2,179
Center for Cyberspace Research (CCR)	11	2,694	2	839	13	3,533	2,331
Center for Directed Energy (CDE)	17	2,533	1	19	18	2,552	3,297
Center for Tech Intel Studies & Research (CTISR)	8	1,341	-	-	8	1,341	1,140
Center for Operational Analysis (COA)	12	6,004	-	-	12	6,004	5,212
<b>TOTAL</b>	<b>68</b>	<b>13,786</b>	<b>3</b>	<b>858</b>	<b>71</b>	<b>14,644</b>	<b>14,159</b>

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

**Figure 3.2 New Award History FY03-FY12**



**Figure 3.3 New FY12 Awards by Sponsor**



\*Pie Chart on the right shows breakdown by AFRL Technology Directorates

**Table 3.5 New FY12 Awards to Academic Departments & Research Centers by Sponsor**

Dept.	AFRL \$k	AFMC (Non-AFRL) \$k	Other USAF \$k	Other DOD \$k	NSF \$k	Other Federal \$k	Non- Federal \$k	Total \$k
ENC	410	-	-	70	81	26	-	587
ENG	2,658	110	396	2,739	715	270	-	6,888
ENP	1,400	-	636	3,136	-	50	20	5,242
ENR	19	-	-	-	36	-	-	55
ENS	152	375	1,436	4,126	-	-	-	6,089
ENV	114	-	238	332	-	334	-	1,019
ENY	1,770	30	722	860	-	-	91	3,473
<b>TOTAL</b>	<b>6,523</b>	<b>515</b>	<b>3,428</b>	<b>11,263</b>	<b>832</b>	<b>680</b>	<b>111</b>	<b>23,353</b>

Note: "Other DOD" in this table includes the DTRA, HELJTO, OSD, TRICARE, NGA and NSA pie slices from Figure 3.3, plus funding from other DOD organizations.

**Research  
Center**

ANT	849	-	240	75	-	50	-	1,214
CCR	181	-	-	2,422	710	220	-	3,533
CDE	1,074	-	-	1,478	-	-	-	2,552
CTISR	-	-	345	951	-	25	20	1,341
COA	152	375	1,436	4,041	-	-	-	6,004
<b>TOTAL</b>	<b>2,256</b>	<b>375</b>	<b>2,021</b>	<b>8,967</b>	<b>710</b>	<b>295</b>	<b>20</b>	<b>14,644</b>

Note: All Center funds are also included in departmental funding.

## **4. SPONSORSHIP OF STUDENT RESEARCH**

### **4.1. OFFICE OF THE SECRETARY OF THE AIR FORCE**

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

RODRIGUEZ, ALAN R., *Prediction of Travel Voucher Demand at the Air Force Financial Services Center*. AFIT/GCA/ENC/12-M04. Faculty Advisor: Lt Col Richard L. Warr. Sponsor: SAF/FM.

#### **GRADUATE RESEARCH PAPERS**

ANDERSON, SHANON E., *Employing the Management Internal Control Toolset (MICT) Across the Enterprise*. AFIT/IMO/ENS/12-02. Faculty Advisor: Dr. Jeffrey A. Ogden. Sponsor: SAF. [COA]

BRINE, ERIK G., *Prioritizing Foreign Military Engagements: A Multi Objective Decision Analysis Using Value Focused Thinking*. AFIT/IMO/ENS/12-03. Faculty Advisor: Dr. Stephen P. Chambal. Sponsor: SAF. [COA]

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

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

CONNELL, JOSHUA D., *An Analysis of Turnover Intentions: A Reexamination of Air Force Civil Engineering Company Grade Officers*. AFIT/GEM/ENV/12-M01. Faculty Advisor: Dr. Alfred E. Thal. Sponsor: HQ USAF/A7.

HARNLY, MARIE T., *Infrastructure Asset Management Modeling Through an Analysis of the Air Force Strategic Vision and Goals*. AFIT/GEM/ENV/12-M07. Faculty Advisor: Lt Col William E. Sitzabee. Sponsor: AFCESA & HQ USAF/A7.

#### **GRADUATE RESEARCH PAPERS**

CARMICHAEL, CHRISTOPHER L., *An Empirical Investigation of the Effectiveness of the Logistics Readiness Squadron Concept*. AFIT/IMO/ENS/12-04. Faculty Advisor: Lt Col Doral E. Sandlin. Sponsor: HQ USAF/A4. [COA]

LYNCH, SARAH R., *Remotely Piloted Aircraft (RPA) Performing the Air Refueling Mission*. AFIT/IMO/ENS/12-08. Faculty Advisor: Dr. Alan R. Heminger. Sponsor: HQ AMC & HQ USAF/A5.

STANLEY, DALE W., III, *Predicting Pilot Retention*. AFIT/IMO/ENS/12-13. Faculty Advisor: Lt Col Shay R. Capehart. Sponsor: HQ USAF/A1.

### **4.3. AIR COMBAT COMMAND**

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

GIPSON, JONATHON S., *Air-to-Air Missile Enhanced Scoring with Kalman Smoothing*. AFIT/GE/ENG/12-18. Faculty Advisor: Lt Col Kenneth A. Fisher. Sponsor: ACC. [ANT]

KINNE, JEREMY P., *The Effect of Multiple Interventions on Environmental Attitudes and Behaviors*. AFIT/GEM/ENV/12-M11. Faculty Advisor: Dr. Alfred E. Thal. Sponsor: AMC/60 CES & ACC/9 CES.

SWEENEY, NICHOLAS, *Air-to-Air Missile Vector Scoring*. AFIT/GE/ENG/12-38. Faculty Advisor: Lt Col Kenneth A. Fisher. Sponsor: 83 FWS. [ANT]



## **GRADUATE RESEARCH PAPERS**

DIEHL, DANIEL C., *Cost Comparison of B-1B Non-Mission-Capable Drivers Using Finite Source Queuing with Spares*. AFIT/IOA/ENS/12-01. Faculty Advisor: Dr. Jeffery K. Cochran. Sponsor: ACC. [COA]

SMITH, BRIAN J., *C-17 Weapons Instructor Course: Unit Basing to Optimize Operational Efficiency and Mission Effectiveness*. AFIT/IMO/ENS/12-12. Faculty Advisor: Dr. William A. Cunningham. Sponsor: AMC/A3 & ACC/USAFWS. [COA]

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

### **MASTER'S THESES**

KINKLE, MARISHA T., *A Multi-Stage Optimization Model for Air Force Reserve Officer Training Corps Officer Candidate Selection*. AFIT/OR-MS/ENS/12-16. Faculty Advisor: Maj Matthew J. Robbins. Sponsor: AFROTC. [COA]

ROSE, CHRISTOPHER W., *An Enhanced Satellite Command and Control Systems Architecture*. AFIT/GSE/ENV/12-M09. Faculty Advisor: Dr. David R. Jacques. Sponsor: 381 TRG.

## **AIR FORCE INSTITUTE OF TECHNOLOGY**

### **DOCTORAL DISSERTATIONS**

CESUL, BRANDON T., *Investigation into Suitability of Geopolymers (Illite & Metakaolin) for the Space Environment*. AFIT/DS/ENY/12-14. Faculty Advisor: Dr. Shankar Mall. Sponsor: N/A.

CO, THOMAS, C., *Operationally Responsive Spacecraft Using Electric Propulsion*. AFIT/DS/ENY/12-01. Faculty Advisor: Dr. Jonathan T. Black. Sponsor: N/A.

MASSAR, MELODY R., *Local Histograms for Per-Pixel Classification*. AFIT/DAM/ENC/12-02. Faculty Advisor: Dr. Matthew C. Fickus. Sponsor: N/A.

REYNOLDS, MICHAEL B., *Resource Provisioning in Large-Scale Self-Organizing Distributed Systems*. AFIT/DCS/ENG/12-03. Faculty Advisor: Dr. Kenneth M. Hopkinson. Sponsor: N/A.

SHOCKLEY, JEREMIAH A., *Ground Vehicle Navigation Using Magnetic Field Variation*. AFIT/DEE/ENG/12-17. Faculty Advisor: Dr. John F. Raquet. Sponsor: N/A. [ANT]

SHEELY, EUGENE V., *Theoretical Study of the Effects of Di-Muonic Molecules on Muon-Catalyzed Fusion*. AFIT/DS/ENP/12-M02. Faculty Advisor: Dr. Larry W. Burggraf. Sponsor: N/A.

WILLIAMS, JASON P., *Towards the Mitigation of Correlation Effects in the Analysis of Hyperspectral Imagery with Extensions to Robust Parameter Design*. AFIT/DS/ENS/12-07. Faculty Advisor: Dr. Kenneth W. Bauer. Sponsor: N/A. [COA]

### **MASTER'S THESES**

ALOISI, ACHILLE H., *Space Systems Engineering Case Study Highlighting Challenges of Commonality*. AFIT/GSE/ENV/12-J02DL. Faculty Advisor: Dr. John M. Colombi. Sponsor: N/A.

ANDREWS, BLYTHE A., *A Colony II CubeSat Mission Modeling Tool*. AFIT/GA/ENY/12-M01. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: N/A.

AVRETT, JOHN T., *Optimum Concentration Ratio Analysis Using Dynamic Thermal Model for Concentrated Photovoltaic System*. AFIT/GE/ENG/12-01. Faculty Advisor: Dr. Stephen C. Cain. Sponsor: N/A.

BALDASSARI, KYLE M., *Considerations for Employment of Defensive Counter Cyberspace Forces for Hunter Operations*. AFIT/ICW/ENG/12-01. Faculty Advisor: Dr. Robert F. Mills. Sponsor: N/A. [CCR]

BANNACH, DANE M., *Improved Satellite Detection by Doppler Shifted Signals Off of the Air Force Space Surveillance System*. AFIT/GA/ENY/12-M43. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: N/A.

BEARD, WILLIAM P., *Personnel, the Class 0 Supply Item: A Logistics Management Approach to Supplying Combatant Commanders with Warfighters*. AFIT/LSCM/ENS/12-01. Faculty Advisor: Lt Col Sharon G. Heilmann. Sponsor: N/A. [COA]

BENSON, MICHAEL R., *Characterization and Measurements from the Infrared Grazing Angle Reflectometer*. AFIT/OSE/ENP/12-J01. Faculty Advisor: Dr. Michael A. Marciniak. Sponsor: N/A. [CDE]

BREWER, MEGAN R., *CubeSat Attitude Determination and Helmholtz Cage Design*. AFIT/GAE/ENY/12-M03. Faculty Advisor: Dr. Eric D. Swenson. Sponsor: N/A.

BRODBECK, ROBERT C., *Covert Android Rootkit Detection: Evaluating Linux Kernel Level Rootkits on the Android Operating System*. AFIT/GCO/ENG/12-14. Faculty Advisor: Dr. Rusty O. Baldwin. Sponsor: N/A. [CCR]

BRUEGGEN, ADAM R., *Trade-offs in a 1 Tbps MIMO Communication System Between an Airship and an Array of Ground Receive Antennas*. AFIT/GE/ENG/12-04. Faculty Advisor: Dr. Richard K. Martin. Sponsor: N/A.

BUTLER, HARRIS K., *The Relationship Between Diversity and Accuracy in Multiple Classifier Systems*. AFIT/OR-MS/ENS/12-05. Faculty Advisor: Lt Col Mark A. Friend. Sponsor: N/A. [COA]

CARMER, JOSHUA C., *Design, Integration and Test of the ALICE CubeSat Space and Ground Segments*. AFIT/GSS/ENY/12-M03. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: N/A.

CICALE, RANDY S., *Cooperative Localization on Computationally Constrained Devices*. AFIT/GCO/ENG/12-04. Faculty Advisor: Maj Jeffrey M. Hemmes. Sponsor: N/A. [ANT & CCR]

COMPTON, ANDREW J., *Workload-Based Automated Interface Mode Selection*. AFIT/GCE/ENG/12-03. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: N/A. [CCR]

COVER, DEANE E., *A Prototype Overview for Allocating USAID Foreign Aid*. AFIT/OR-MS/ENS/12-08. Faculty Advisor: Dr. Richard F. Deckro. Sponsor: N/A.

DIROSARIO, JOSEPH P., *Asset Management: Roof Maintenance and Facility Energy Retrofits*. AFIT/GEM/ENV/12-M04. Faculty Advisor: Lt Col Peter P. Feng. Sponsor: N/A.

DISMUKES, TAMILYN S., *Surveillance Versus Reconnaissance: An Entropy Based Model*. AFIT/OR-MS/ENS/12-09. Faculty Advisor: Dr. Darryl K. Ahner. Sponsor: N/A. [COA]

DI TRAPANI, LYALL J., *A Real-Time Strategy Agent Framework and Strategy Classifier for Computer Generated Forces*. AFIT/GCS/ENG/12-04. Faculty Advisor: Dr. Gary B. Lamont. Sponsor: N/A.

ELSNER, DAVID L., *Universal Plug-n-Play Sensor Integration for Advanced Navigation*. AFIT/GE/ENG/12-12. Faculty Advisor: Lt Col Kenneth A. Fisher. Sponsor: N/A. [ANT]

FAIDI, ANIS, *Effect of Accessory Power Take-Off Variation on a Turbofan Engine Performance*. AFIT/GAE/ENY/12-S26. Faculty Advisor: Dr. Paul I. King. Sponsor: N/A.

FERREL, SIMON S., *Matrix Determination of Reflectivity of Hidden Objects via Indirect Photography*. AFIT/APPLPHY/ENP/12-M05. Faculty Advisor: Dr. Michael A. Marciniak. Sponsor: N/A. [CDE]

GABRIELSON, TJ E., *Turnover Intentions: A Quantitative Analysis of Comments from Air Force Civil Engineering Company Grade Officers*. AFIT/GEM/ENV/12-M05. Faculty Advisor: Lt Col John J. Elshaw. Sponsor: N/A.

GERICS, SCOTT E., *Intra-Procedural Path-Insensitive Grams (i-grams) and Disassembly Based Features for Packer Tool Classification and Detection*. AFIT/GCE/ENG/12-07. Faculty Advisor: Dr. Rusty O. Baldwin. Sponsor: N/A. [CCR]

GILBERT, JOSEPH I., *Scalable Wavelet-Based Active Network Stepping Stone Detection*. AFIT/GE/ENG/12-17. Faculty Advisor: Lt Col David J. Robinson. Sponsor: N/A. [CCR]

GILLIGAN, MARTIN A., *Magnesium Object Manager Sandbox, A More Effective Sandbox Method for Windows 7*. AFIT/GCE/ENG/12-05. Faculty Advisor: Lt Col Jeffrey W. Humphries. Sponsor: N/A. [CCR]

GOODSON, MATTHEW N., *Applications of Aerodynamic Forces for Spacecraft Orbit Maneuverability in Operationally Responsive Space and Space Reconstitution Needs*. AFIT/GA/ENY/12-M09. Faculty Advisor: Dr. Jonathan T. Black. Sponsor: N/A.

GRESHAM, JAMES L., *Optical Closed-Loop Control Tracking with Commercial Telescopes*. AFIT/GAE/ENY/12-M19. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: N/A.

GUBLER, TYRONE C., *The White-Hat Bot: A Novel Botnet Defense Strategy*. AFIT/GCS/ENG/12-05. Faculty Advisor: Lt Col Jeffrey M. Hemmes. Sponsor: N/A. [CCR]

HAINES, CHRISTOPHER B., *A Model for Reducing Uncertainty in ISR Collection Operations*. AFIT/OR-MS/ENS/12-13. Faculty Advisor: Dr. Darryl K. Ahner. Sponsor: N/A. [COA]

HALWES, SCOTT W., *Impact of Self-Reported Biases and Familiarity in a Baggage Screening Context*. AFIT/GIR/ENV/12-M01. Faculty Advisor: Lt Col Brent T. Langhals. Sponsor: N/A.

HAMMOND, GLENN B., II, *Target Classification of Canonical Scatterers Using Classical Estimation and Dictionary Based Techniques*. AFIT/GE/ENG/12-19. Faculty Advisor: Dr. Julie A. Jackson. Sponsor: N/A.

HARRINGTON, RYAN C., *Final Design and Integration of the Alice CubeSat Mission*. AFIT/GSS/ENY/12-M04. Faculty Advisor: Dr. Jonathan T. Black. Sponsor: N/A.

HELFEN, JOSHUA D., *Satellite Security: State Analysis Based Command Evaluation*. AFIT/GCO/ENG/12-05. Faculty Advisor: Lt Col Jeffrey W. Humphries. Sponsor: N/A. [CCR]

HERSACK, JONATHAN D., *Utilizing Graphics Processing Units for Network Anomaly Detection*. AFIT/GCO/ENG/12-24. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: N/A. [CCR]

HOLLINGSWORTH, JOSHUA D., *Understanding the Impact of Bead Type on Paint and Thermoplastic Pavement Markings*. AFIT/GEM/ENV/12-M08. Faculty Advisor: Lt Col William E. Sitzabee. Sponsor: N/A.

HUNT, PETER A., *Electromagnetic Interference Behavior of Multiwall Carbon Nanotubes and Carbon Nanofibers Composites Under Fatigue*. AFIT/GMS/ENY/12-M01. Faculty Advisor: Dr. Shankar Mall. Sponsor: N/A.

HUNTER, TERI M., *An Analysis of the Impact of Job Search Behaviors on Air Force Company Grade Officer Turnover*. AFIT/LSCM/ENS/12-06. Faculty Advisor: Lt Col Sharon G. Heilmann. Sponsor: N/A. [COA]

JASZKOWIAK, JOHN C., *Maintenance Operations of Airfield Pavement Markings*. AFIT/GEM/ENV/12-M09. Faculty Advisor: Lt Col William E. Sitzabee. Sponsor: N/A.

KALLONIATIS, CHRISTOFOROS, *Exploring the Dynamics and Modeling National Budget as a Supply Chain System: A Proposal for Reengineering the Budgeting Process and for Developing a Management Flight Simulator*. AFIT/LSCM/ENS/12-07. Faculty Advisor: Dr. William A. Cunningham. Sponsor: N/A. [COA]

KAUPA, DOUGLAS F., *Structural and Thermal Design Analysis of a Space-Based Chromotomographic Hyperspectral Imaging Experiment*. AFIT/GA/ENY/12-M10. Faculty Advisor: Dr. Jonathan T. Black. Sponsor: N/A.

KILLION, CHRISTOPHER B., *Augmenting the Global Positioning System with Foreign Navigation Systems and Alternative Sensors*. AFIT/GE/ENG/12-24. Faculty Advisor: Lt Col Michael J. Stepaniak. Sponsor: N/A. [ANT]

LEUTHOLD, NATHAN M., *A Proposed Mediation Model of the Effects of Motivation for a Healthy Lifestyle: Impacts on Emotional Exhaustion, Medication Regimens and Low-Density Lipoprotein*. AFIT/GEM/ENV/12-M12. Faculty Advisor: Lt Col John J. Elshaw. Sponsor: N/A.

LORIMER, SETH M., *Improving Effectiveness of Monetary Weapon Systems in Afghanistan*. AFIT/GEM/ENV/12-M13. Faculty Advisor: Lt Col Peter P. Feng. Sponsor: N/A.

LUDWIG, MATTHEW T., *UHF Antenna Design for AFIT Random Noise Radar*. AFIT/GE/ENG/12-28. Faculty Advisor: Dr. Peter J. Collins. Sponsor: N/A. [ANT]

MAGAZU, DOMENIC III, *Exploiting the Automatic Dependent Surveillance-Broadcast System via False Target Injection*. AFIT/GCO/ENG/12-07. Faculty Advisor: Dr. Robert F. Mills. Sponsor: N/A. [CCR]

MALINE, JARED J., *Reducing Operating Costs by Optimizing Space in Facilities*. AFIT/GEM/ENV/12-M14. Faculty Advisor: Lt Col William E. Sitzabee. Sponsor: N/A.

MASTERS, GREGORY P., *Evaluation of Malware Target Recognition Deployed in a Cloud-Based Fileserver Environment*. AFIT/GCO/ENG/12-08. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: N/A. [CCR]

MCCONNELL, SHANE N., *Spectral and Spatial Coherent Emission of Thermal Radiation from Metal-Semiconductor Nanostructures*. AFIT/EE.ABET/ENP/12-M01. Faculty Advisor: Dr. Michael A. Marciniak. Sponsor: N/A. [CDE]

MERRIT, ERIC J., *Creating Network Attack Priority Lists by Analyzing Email Traffic Using Predefined Profiles*. AFIT/GCO/ENG/12-19. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: N/A. [CCR]

MILLER, CASEY C., *Cyberspace and Real-World Behavioral Relationships: Towards the Application of Internet Search Queries to Identify Individuals At-Risk for Suicide*. AFIT/GCE/ENG/12-08. Faculty Advisor: Maj Jonathan W. Butts. Sponsor: N/A. [CCR]

MILLER, JONATHAN D., *Binary Disassembly Block Coverage by Symbolic Execution vs. Recursive Descent*. AFIT/GCO/ENG/12-09. Faculty Advisor: Dr. Rusty O. Baldwin. Sponsor: N/A. [CCR]

MITCHELL, TARAH D., *A Women-Only Comparison of the U.S. Air Force Fitness Test and the Marine Combat Fitness Test*. AFIT/GCA/ENC/12-01. Faculty Advisor: Dr. Edward D. White. Sponsor: N/A.

NELSON, ERIC W., *Link Performance Analysis for a Proposed Future Architecture of the Air Force Satellite Control Network*. AFIT/GSE/ENV/11-D06DL. Faculty Advisor: Dr. John M. Colombi. Sponsor: N/A.

NUNNALLY, BEAU A., *Using Multiattribute Utility Copulas in Support of UAV Search and Destroy Operations*. AFIT/OR-MS/ENS/12-20. Faculty Advisor: Maj Matthew J. Robbins. Sponsor: N/A. [COA]

OLIPANE, ROBERT J., *Short Message Service (SMS) Command and Control (C2) Awareness in Android-Based Smartphones Using Kernel-Level Auditing*. AFIT/GCO/ENG/12-21. Faculty Advisor: Dr. Robert F. Mills. Sponsor: N/A. [CCR]

PRILESZKY, ISTVAN M., *Cross Hallway Detection and Indoor Localization Using Flash Laser Detection and Ranging*. AFIT/GE/ENG/12-34. Faculty Advisor: Lt Col Michael J. Stepaniak. Sponsor: N/A. [ANT]

RIAZ, MUHAMMAD S., *Value Focused Thinking for Nation Building in Afghanistan: A Regional Perspective*. AFIT/OR-MS/ENS/12-22. Faculty Advisor: Dr. Richard F. Deckro. Sponsor: N/A.

ROZZONI, JAMES M., *Analysis of Leadership in Energy and Environmental Design® Construction in the Air Force*. AFIT/GEM/ENV/12-M17. Faculty Advisor: Lt Col Peter P. Feng. Sponsor: N/A.

SANDUSKY, JEFFREY C., *Individual Resistance to Change*. AFIT/GIR/ENV/12-S01. Faculty Advisor: Lt Col John J. Elshaw. Sponsor: N/A.

SCHIFF, ZACHARY L., *A Spatial Risk Analysis of Oil Refineries within the United States*. AFIT/GEM/ENV/12-M18. Faculty Advisor: Lt Col William E. Sitzabee. Sponsor: N/A.

SELLERS, SPENCER R., *FDTD Simulation of Novel Polarimetric and Directional Reflectance and Transmittance Measurements from Optical Nano- and Micro-Structured Materials*. AFIT/EE.ABET/ENP/12-M02. Faculty Advisor: Dr. Michael A. Marciniak. Sponsor: N/A. [CDE]

SHA, FRANK T., *Structural Health Monitoring of M1114 High Mobility Multipurpose Wheeled Vehicle Armor System*. AFIT/GEM/ENV/12-M19. Faculty Advisor: Dr. Som R. Soni. Sponsor: N/A.

SHANK, JASON C., *Development and Testing of a Rotating Detonation Engine Run on Hydrogen and Air*. AFIT/GAE/ENY/12-M36. Faculty Advisor: Dr. Paul I. King. Sponsor: N/A.

SIEVERS, MATTHEW D., *Data Exfiltration Detection Performance Analysis Using Dedicated Deep Packet Inspection*. AFIT/GCO/ENG/12-11. Faculty Advisor: Dr. Robert F. Mills. Sponsor: N/A. [CCR]

SITU, JOHN X., *Combat Identification of Synthetic Aperture Radar Images Using Contextual Features and Bayesian Belief Networks*. AFIT/OR-MS/ENS/12-24. Faculty Advisor: Lt Col Mark A. Friend. Sponsor: N/A. [COA]

SMITH, LINDSAY N., *Determining Angular Frequency from a Video with a Generalized Fast Fourier Transform*. AFIT/GAM/ENC/12-02. Faculty Advisor: Dr. Matthew C. Fickus. Sponsor: N/A.

STURTEVANT, MATTHEW D., *The Application of Sensors on Guardrails for the Purpose of Real Time Impact Detection*. AFIT/GEM/ENV/12-M20. Faculty Advisor: Lt Col William E. Sitzabee. Sponsor: N/A.

SU'E, CHAD B., *Characterization of a Hyperspectral Chromotomographic Imaging Ground System*. AFIT/EE.ABET/ENP/12-M03. Faculty Advisor: Lt Col Michael R. Hawks. Sponsor: N/A. [CTISR]

SULLIVAN, MICHAEL P., *Characteristics, Causes and Evaluation of Helicopter Particulate Obstruction*. AFIT/GAE/ENY/12-S46. Faculty Advisor: Dr. Donald L. Kunz. Sponsor: N/A.

TAN, HUANG TENG, *The In-Transit Vigilant Covering Tour Problem for Routing Unmanned Ground Vehicles*. AFIT/OR-MS/ENS/12-31. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: N/A. [COA]

THORSON, TIMOTHY J., *Simultaneous Range-Velocity Processing and SNR Analysis of AFIT's Random Noise Radar*. AFIT/GE/ENG/12-40. Faculty Advisor: Lt Col Geoffrey A. Akers. Sponsor: N/A.

- TOPALOGLU, IHSAN, *Initial Spare Parts of the A400M Aircraft*. AFIT/LSCM/ENS/12-20. Faculty Advisor: Maj Daniel D. Mattioda. Sponsor: N/A. [COA]
- URBAN, DANIEL A., *Application of Commercial Software to CubeSat Thermal Analysis*. AFIT/GS/ENY/12-M41. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: N/A.
- WASHINGTON, DAVID, *The Moderating Effect of Psychological Empowerment on the Relationship Between Network Centrality and Individual Job Performance*. AFIT/GEM/ENV/12-M21. Faculty Advisor: Lt Col John J. Elshaw. Sponsor: N/A.
- WILLIAMS, DANIEL M., *Empirical Characterization of Unconstrained Tape Spring Deployment Dynamics*. AFIT/GSS/ENY/12-M07. Faculty Advisor: Dr. Jonathan T. Black. Sponsor: N/A.
- WILSON, TIMOTHY J., *MFIRE-2: A Multi Agent System for Flow-Based Intrusion Detection Using Stochastic Search*. AFIT/GCO/ENG/12-12. Faculty Advisor: Dr. Gary B. Lamont. Sponsor: N/A.
- WOLF, ANDRE, *A Performance Analysis of the Optimized Link State Routing Protocol Using Voice Traffic Over Mobile Ad Hoc Networks*. AFIT/GE/ENG/12-44. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: N/A. [CCR]
- ZAGARIS, CONSTANTINOS, *Trajectory Control and Optimization for Responsive Spacecraft*. AFIT/GA/ENY/12-M13. Faculty Advisor: Dr. Jonathan T. Black. Sponsor: N/A.
- ZORN, AARON J., *High-Performance Work Practices: A Case Study Using the Phenomenological Approach*. AFIT/GEM/ENV/12-M22. Faculty Advisor: Dr. Alfred E. Thal. Sponsor: N/A.

#### **GRADUATE RESEARCH PAPERS**

- BIXBY, ERIC R., *An Analysis of the Computer Security Ramifications of Weakened Asymmetric Cryptographic Algorithms*. AFIT/ICW/ENG/12-02. Faculty Advisor: Dr. Robert F. Mills. Sponsor: N/A. [CCR]
- BUTLER, MATT J., *Rapid Delivery of Cyber Capabilities: Evaluation of the Requirement for a Rapid Cyber Acquisition Process*. AFIT/ICW/ENG/12-03. Faculty Advisor: Maj Jonathan W. Butts. Sponsor: N/A. [CCR]
- COLBURN, RYAN M., FORD, JENNIFER S., & MORRIS, YOSEF A., *Principles of Rapid Acquisition and Systems Engineering*. AFIT/ISE/ENV/12-J01. Faculty Advisor: Dr. John M. Colombi. Sponsor: N/A.
- FORD, JENNIFER S., See COLBURN, RYAN M.
- MORRIS, YOSEF A., See COLBURN, RYAN M.
- TINNEY, JODI M., *The Effects of Supply Chain Orientation, Supply Chain Management and Collaboration on Perceived Firm Performance*. AFIT/ILS/ENS/12-06. Faculty Advisor: Dr. William A. Cunningham. Sponsor: N/A. [COA]
- WIMMER, APRIL L., *Evaluating the Effectiveness of Air Force Foundational Cyberspace Training*. AFIT/ICW/ENG/12-05. Faculty Advisor: Maj Jonathan W. Butts. Sponsor: N/A. [CCR]

## 4.5. AIR FORCE MATERIEL COMMAND

### MASTER'S THESES

BLAKE, JASON A., *Modeling and Analysis of AF Depot Business Practices for Supply*. AFIT/OR-MS/ENS/12-03. Faculty Advisor: Dr. John O. Miller. Sponsor: AFMC/402 SCMS. [COA]

BUTLER, JEDEDIAH H., *Accurate Modeling of Stability and Control Properties for Fighter Aircraft from CFD*. AFIT/GAE/ENY/12-M04. Faculty Advisor: Maj Andrew J. Lofthouse. Sponsor: AFMC/46 SK.

DELORIT, JUSTIN D., *Evaluation of Municipal Wastewater Treatment Plant Activated Sludge for Biodegradation of Propylene Glycol as an Aircraft Deicing Fluid*. AFIT/GEM/ENV/12-M03. Faculty Advisor: Maj LeeAnn Racz. Sponsor: AFMC.

HARTBERGER, JEFFERY E., *Background-Oriented Schlieren Pattern Optimization*. AFIT/GAE/ENY/11-D16. Faculty Advisor: Dr. Mark F. Reeder. Sponsor: AFMC.

HOGGE, LOUIS J., *Effective Measurement of Reliability of Repairable USAF Systems*. AFIT/GSE/ENV/12-S02DL. Faculty Advisor: Dr. John M. Colombi. Sponsor: AFMC/748 SCMG.

KIRCHNER, AIMEE T., *The Effects of Cognitive-Behavioral Motivation for Health Improvement on Anthropometric Measurements in High Risk Individuals*. AFIT/GCA/ENV/12-M02. Faculty Advisor: Lt Col Darin A. Ladd. Sponsor: AFMC/88 AMDS.

KNORR, LAURIE C., *Leading Indicator Analysis for High Speed Sled Test Programs*. AFIT/GSE/ENV/12-M03DL. Faculty Advisor: Dr. John M. Colombi. Sponsor: AFMC/846 TS.

KOSLOW, MICHAEL J., *Ballistic Flash Characterization: Penetration and Back-Face Flash*. AFIT/OR-MS/ENS/12-17. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: AFMC/46 TG. [COA]

LOW, MICHAEL S., *Impact of Decision Criteria on Federal Aviation Administration Certification of Military Commercial Derivative Aircraft*. AFIT/LSCM/ENS/12-10. Faculty Advisor: Dr. Alan W. Johnson. Sponsor: AFMC/A4. [COA]

MCWILLIAMS, MARCUS R., *Improving Knowledge of C-130 Aircraft Condition: A High Velocity Maintenance Case Study*. AFIT/LSCM/ENS/12-11. Faculty Advisor: Dr. Alan W. Johnson. Sponsor: AFMC/A4. [COA]

PEYTON, DAVID J., *Ballistic Flash Characterization of Entry-Side Flash*. AFIT/OR-MS/ENS/12-21. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: AFMC/46 TG. [COA]

SMYTH, KEVIN B., *W78 Weapon System Supply Web: Discrete Event Simulation Modeling for Life Extension Program Planning*. AFIT/LSCM/ENS/12-18. Faculty Advisor: Dr. Alan W. Johnson. Sponsor: AFMC/498 NSW. [COA]

WILLIAMS, KRISTY N., *A Benchmarking Study of Air Force Program Manager Competencies*. AFIT/OR-MS/ENS/12-28. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: AFMC/A9. [COA]

### GRADUATE RESEARCH PAPERS

BAILEY, CRAIG S., *Critical Elements and Needs for Nuclear Weapons Maintenance: A Delphi Study*. AFIT/ILS/ENS/12-01. Faculty Advisor: Dr. Alan W. Johnson. Sponsor: AFMC/A10. [COA]

CARTER, CHARLES L., *Intelligence Support to Supply Chain Risk Management*. AFIT/ILS/ENS/12-02. Faculty Advisor: Maj Daniel D. Mattioda. Sponsor: AFMC/IS. [COA]

EHASZ, ROBERT F., *Avian Radar: Is it Worth the Cost?* AFIT/ILS/ENS/12-03. Faculty Advisor: Dr. William A. Cunningham. Sponsor: AFMC/CA. [COA]

### **AERONAUTICAL SYSTEMS CENTER**

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

CARRANO, RICHARD P., *Mitigating Diminishing Manufacturing Sources/Material Shortages (DMS/MS) and Obsolescence for the T-6 Canopy Fracturing Initiation System (CFIS)*. AFIT/GSE/ENV/12-M01DL. Faculty Advisor: Dr. John M. Colombi. Sponsor: ASC/WN.

CHENERY, MICHAEL G., *Computational Analysis and Characterization of RC-135 External Aerodynamics*. AFIT/GAE/ENY/12-M06. Faculty Advisor: Maj Andrew J. Lofthouse. Sponsor: ASC.

DENNEY, DUANE M., *High Velocity Maintenance Implementation Strategies on Low Observable Aircraft*. AFIT/LSCM/ENS/12-03. Faculty Advisor: Maj Daniel D. Mattioda. Sponsor: ASC. [COA]

HARVEY, WALTER B., & RYAN, CHARLES M., *A Quantitative Analysis of the Benefits of Prototyping Fixed-Wing Aircraft*. AFIT/GSE/ENV/12-J02. Faculty Advisor: Dr. John M. Colombi. Sponsor: ASC.

MILLER, KARI A., *Diminishing Manufacturing Sources and Material Shortages Mitigation Strategies: A Multiple-Case Study*. AFIT/LSCM/ENS/12-13. Faculty Advisor: Maj Daniel D. Mattioda. Sponsor: ASC. [COA]

RUBINO, DEREK P., *A Multiple-Case Study on Department of Defense Insourcing Projects*. AFIT/GLM/ENS/12-15. Faculty Advisor: Dr. Jeffrey A. Ogden. Sponsor: ASC. [COA]

RYAN, CHARLES M., See HARVEY, WALTER B.

#### **GRADUATE RESEARCH PAPERS**

LEE, JORDAN D., *The Comparison of Strategies Used in the Game of RISK via Markovian Analysis and Monte-Carlo Simulation*. AFIT/IOA/ENS/12-02. Faculty Advisor: Dr. James W. Chrissis. Sponsor: CAA & ASC. [COA]

MIDDLETON, CHARLES J., *Risk Assessment Planning for Airborne Systems: An Information Assurance Failure Mode, Effects and Criticality Analysis Methodology*. AFIT/IOA/ENS/12-05. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: ASC. [COA]

### **AIR FORCE GLOBAL LOGISTICS SUPPORT CENTER**

#### **DOCTORAL DISSERTATIONS**

HARPER, TIFFANY J., *Agent Based Modeling and Simulation Framework for Supply Chain Risk Management*. AFIT/DS/ENS/12-02. Faculty Advisor: Dr. John O. Miller. Sponsor: AFGLSC. [COA]

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

WILLIAMS, DAVID R., *Examining EXPRESS with Simulation*. AFIT/OR-MS/ENS/12-27. Faculty Advisor: Dr. John O. Miller. Sponsor: AFGLSC. [COA]

### **AIR FORCE LIFE CYCLE MANAGEMENT CENTER**

#### **GRADUATE RESEARCH PAPERS**

HORTON, JASON D., *Conflict: Operational Realism Versus Analytical Rigor in Defense Modeling and Simulation*. AFIT/ISE/ENV/12-J04. Faculty Advisor: Dr. David R. Jacques. Sponsor: AFLCMC.



## **AIR FORCE NUCLEAR WEAPONS CENTER**

### **MASTER'S THESES**

MILLER, ALLEN R., *Minuteman III Cost Per Alert Hour Analysis*. AFIT/LCSM/ENS/12-12. Faculty Advisor: Dr. William A. Cunningham. Sponsor: AFNWC. [COA]

SISEK, AARON J., *Radar Return Degradation of Aircraft Paint from a Nuclear Weapon Thermal Pulse*. AFIT/NUCL/ENP/12-M07. Faculty Advisor: Dr. James C. Petrosky. Sponsor: AFNWC.

## **AFRL: AIR FORCE RESEARCH LABORATORY**

### **MASTER'S THESES**

O'CONNELL, PHILLIP J., *Systems Engineering Applications for Small Business Innovative Research (SBIR) Projects*. AFIT/GSE/ENV/12-S01. Faculty Advisor: Lt Col Joseph R. Wirthlin. Sponsor: AFRL/XP.

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

### **DOCTORAL DISSERTATIONS**

KOLSTI, KYLE F., *Novel Discretization Schemes for the Numerical Simulation of Membrane Dynamics*. AFIT/DS/ENY/12-03. Faculty Advisor: Dr. Donald L. Kunz. Sponsor: AFOSR.

LANGE, MATTHEW A., *Kinetics of the Electrical Discharge Pumped Oxygen-Iodine Laser*. AFIT/DS/ENP/11-S07. Faculty Advisor: Dr. Glen P. Perram. Sponsor: AFOSR. [CDE]

MARTIN, CHRISTOPHER L., JR., *Coupled Radiation-Gasdynamic Solution Method for Hypersonic Shock Layers in Thermochemical Nonequilibrium*. AFIT/DS/ENY/11-16. Faculty Advisor: Dr. Robert B. Greendyke. Sponsor: AFOSR.

O'HARA, RYAN P., *The Characterization of Material Properties and Structural Dynamics of the Manduca Sexta Forewing for Application to Flapping Wing Micro Air Vehicle Design*. AFIT/DS/ENY/12-06. Faculty Advisor: Dr. Anthony N. Palazotto. Sponsor: AFOSR & AFRL/RB.

RYTHER, CHAD E.C., *The Effect of Elevated Temperature on the Inelastic Deformation Behavior of PMR-15 Solid Polymer*. AFIT/DS/ENY/12-12. Faculty Advisor: Dr. Marina B. Ruggles-Wrenn. Sponsor: AFOSR.

### **MASTER'S THESES**

BARRON, JOHN W., *RSA Power Analysis Obfuscation: A Dynamic FPGA Architecture*. AFIT/GE/ENG/12-02. Faculty Advisor: Maj Todd R. Andel. Sponsor: AFOSR. [CCR]

BETANCES, JOAN A., *Context Aware Routing Management Architecture for Airborne Networks*. AFIT/GCE/ENG/12-01. Faculty Advisor: Dr. Kenneth M. Hopkinson. Sponsor: AFOSR.

BROWN, BRANDON A., *An FPGA Noise Resistant Digital Temperature Sensor with Auto Calibration*. AFIT/GCE/ENG/12-02. Faculty Advisor: Maj Todd R. Andel. Sponsor: AFOSR. [CCR]

CARBINO, TIMOTHY J., *Adaptive Routing Algorithm for Priority Flows in a Network*. AFIT/GE/ENG/12-08. Faculty Advisor: Dr. Kenneth M. Hopkinson. Sponsor: AFOSR.

FOLEY, BETHANY G., *A Dempster-Shafer Method for Multi-Sensor Fusion*. AFIT/GAM/ENC/12-03. Faculty Advisor: Dr. Aihua W. Wood. Sponsor: AFOSR. [ANT]

FRITZKE, AUSTIN W., *Obfuscating Against Side-Channel Power Analysis Using Hiding Techniques for AES*. AFIT/GE/ENG/12-15. Faculty Advisor: Maj Todd R. Andel. Sponsor: AFOSR. [CCR]

HADSALL, KEVIN A., *Inelastic Deformation Behavior of an MVK-14-Based Composite: Experiment and Modeling*. AFIT/GAE/ENY/12-M20. Faculty Advisor: Dr. Marina B. Ruggles-Wrenn. Sponsor: Multiscale Design System, LLC & AFOSR.

HAMILTON, MERLE D., *Electrical and Optical Characterizations of Si-Ge-Sn*. AFIT/APPLPHY/ENP/12-M06. Faculty Advisor: Dr. Yung Kee Yeo. Sponsor: AFOSR.

HIGGINS, DANIEL J., *Positron Lifetime Modulation by Electric Field Induced Positronium Formation on a Gold Surface*. AFIT/NUCL/ENP/12-M03. Faculty Advisor: Dr. Larry W. Burggraf. Sponsor: AFOSR.

HOLLENBECK, ALEX C., *Evaluation of the Thorax of Manduca Sexta for Flapping-Wing Micro Air Vehicle Applications*. AFIT/GAE/ENY/12-M22. Faculty Advisor: Dr. Anthony N. Palazotto. Sponsor: AFOSR.

HUBER, DAVID A., *The Use of Various Failure Criteria as Applied to High Speed Wear*. AFIT/GAE/ENY/11-D01. Faculty Advisor: Dr. Anthony N. Palazotto. Sponsor: AFOSR.

HUMPHREY, WILLIAM C., *Validation of the Chemistry Module for the Euler Solver in Unified Flow Solver*. AFIT/GAE/ENY/12-M24. Faculty Advisor: Maj Andrew J. Lofthouse. Sponsor: AFOSR.

JIMENEZ, STEPHEN M., *Design and Characterization of a Three-Dimensional Positron Annihilation Spectroscopy System Using a Low-Energy Positron Beam*. AFIT/NUCL/ENP/12-M04. Faculty Advisor: Dr. Larry W. Burggraf. Sponsor: AFOSR.

KASPEREK, ANDREW T., *Enhancing Trust in the Smart Grid by Applying a Modified Exponentially Weighted Averages Algorithm*. AFIT/GCO/ENG/12-18. Faculty Advisor: Dr. Kenneth M. Hopkinson. Sponsor: AFOSR.

MOTES, JERAMY W., *LADAR Range Image Interpolation Exploiting Pulse Width Expansion*. AFIT/GE/ENG/12-30. Faculty Advisor: Dr. Richard K. Martin. Sponsor: AFOSR.

MURRAY, JEREMY C., *Development of Photographic Dynamic Measurements Applicable to Evaluation of Flapping Wing Micro Air Vehicles*. AFIT/GAE/ENY/11-D02. Faculty Advisor: Dr. Anthony N. Palazotto. Sponsor: AFOSR.

ROSS, KEITH J., *Application of Game Theory to Improve the Defense of the Smart Grid*. AFIT/GCO/ENG/12-10. Faculty Advisor: Dr. Kenneth M. Hopkinson. Sponsor: AFOSR. [CCR]

SCHAFER, JESSICA M., *The Focusing of Light Scattered from Diffuse Reflectors Using Phase Modulation*. AFIT/APPLPHY/ENP/12-M10. Faculty Advisor: Dr. Michael A. Marciniak. Sponsor: AFOSR. [CDE]

SHIPMAN, CRYSTAL M., *An Application of Con-Resistant Trust to Improve the Reliability of Special Protection Systems within the Smart Grid*. AFIT/GCO/ENG/12-22. Faculty Advisor: Dr. Kenneth M. Hopkinson. Sponsor: AFOSR.

SIMPSON, ANTHONY R., *A Trust Management and Security Framework Enhanced to Secure Satellite Command Links Against Cyber Attacks*. AFIT/GCO/ENG/12-23. Faculty Advisor: Kenneth M. Hopkinson. Sponsor: AFOSR.

STEELE, MATTHEW F., *Security Verification of Secure MANET Routing Protocols*. AFIT/GCS/ENG/12-03. Faculty Advisor: Maj Todd R. Andel. Sponsor: AFOSR. [CCR]

STEINBOCK, MICHAEL J., *Implementation of Branch-Point-Tolerant Wavefront Reconstructor for Strong Turbulence Compensation*. AFIT/GE/ENG/12-45. Faculty Advisor: Maj Milo W. Hyde. Sponsor: AFOSR.

SZELAG, THEODORE A., *A Finite Element Analysis of a Carbon Fiber Composite Micro Air Vehicle Wing*. AFIT/GAE/ENY/12-M44. Faculty Advisor: Dr. Anthony N. Palazotto. Sponsor: AFOSR.

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

##### **DOCTORAL DISSERTATIONS**

DILLENBURGER, STEVEN P., *Minimization of Collateral Damage in Airdrops and Airstrikes*. AFIT/DS/ENS/12-01. Faculty Advisor: Dr. Jeffery K. Cochran. Sponsor: AFRL/RB. [COA]

O'HARA, RYAN P., *The Characterization of Material Properties and Structural Dynamics of the Manduca Sexta Forewing for Application to Flapping Wing Micro Air Vehicle Design*. AFIT/DS/ENY/12-06. Faculty Advisor: Dr. Anthony N. Palazotto. Sponsor: AFOSR & AFRL/RB.

VENZIN, ALEXANDER M., *Quantifying Performance Bias in Label Fusion*. AFIT/GAM/ENC/12-04. Faculty Advisor: Dr. Christine M. Schubert Kabban. Sponsor: AFRL/RB.

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

ALMODOVAR, GABRIEL, *Material Characterization for Composite Materials in Load Bearing Wave Guides*. AFIT/GAE/ENY/12-M01. Faculty Advisor: Dr. Anthony N. Palazotto. Sponsor: AFRL/RB.

CURRO, JOSEPH A., II, *Automated Aerial Refueling Position Estimation Using a Scanning LiDAR*. AFIT/GE/ENG/12-11. Faculty Advisor: Dr. John F. Raquet. Sponsor: AFRL/RB. [ANT]

ELGERSMA, JAMES R., *Conceptual Layout of Wing Structure Using Topology Optimization for Morphing Micro Air Vehicles in a Perching Maneuver*. AFIT/GAE/ENY/12-M11. Faculty Advisor: Dr. Donald L. Kunz. Sponsor: AFRL/RB.

FLORA, THOMAS J., *Freedrop Testing and CFD Simulation of Ice Models from a Cavity into Supersonic Flow*. AFIT/GAE/ENY/12-S15. Faculty Advisor: Dr. Mark F. Reeder. Sponsor: AFRL/RB.

TEKELL, JOHN P., *Reynolds Number Effects on Thrust Coefficients and PIV for Flapping Wing Micro Air Vehicles*. AFIT/GAE/ENY/12-M38. Faculty Advisor: Dr. Mark F. Reeder. Sponsor: AFRL/RB.

WEISENBERGER, RICHARD P., *Silicon Carbide Capacitive High Temperature MEMS Strain Transducer*. AFIT/GE/ENG/12-43. Faculty Advisor: Dr. Ronald A. Coutu. Sponsor: AFRL/RB.

WOLFE, DANIEL B., *Boundary Layer Measurements in the Trisonic Gas-Dynamics Facility Using Particle Image Velocimetry with CO<sub>2</sub> Seeding*. AFIT/GAE/ENY/12-M43. Faculty Advisor: Dr. Mark F. Reeder. Sponsor: AFRL/RB.

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

##### **DOCTORAL DISSERTATIONS**

MANTRAVADI, SAMUEL V., *Resolution Study of a Hyperspectral Sensor Using Computed Tomography in the Process of Noise*. AFIT/DEE/ENG/12-06. Faculty Advisor: Dr. Stephen C. Cain. Sponsor: AFRL/RD.

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

KIM, MU J., *Binary Classification of an Unknown Object Through Atmospheric Turbulence Using a Polarimetric Blind-Deconvolution Algorithm Augmented with Adaptive Degree of Linear Polarization Priors*. AFIT/GE/ENG/12-26. Faculty Advisor: Maj Milo W. Hyde. Sponsor: AFRL/RD.

LASORDA, MICHAEL J., *Thermal Space Situational Awareness*. AFIT/GSE/ENV/12-S03DL. Faculty Advisor: Dr. John M. Colombi. Sponsor: AFRL/RD.

MACE, MELANIE E., *Calibration of a Silver Detector Using a PuBe Source*. AFIT/NUCL/ENP/12-J01. Faculty Advisor: Dr. John W. McClory. Sponsor: AFRL/RD.

PETERSON, CURTIS J.R., *Near Earth Object Detection Using a Poisson Statistical Model for Detection on Images Modeled from the Panoramic Survey Telescope and Rapid Response System*. AFIT/GE/ENG/12-33. Faculty Advisor: Dr. Stephen C. Cain. Sponsor: AFRL/RD.

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

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

BEISLEY, ANDREW P., *Spectral Detection of Human Skin in VIS-SWIR Hyperspectral Imagery Without Radiometric Calibration*. AFIT/GE/ENG/12-03. Faculty Advisor: Lt Col Jeffrey D. Clark. Sponsor: 711 HPW/RH.

BINDEWALD, JASON M., *Detector Design Considerations in High-Dimensional Artificial Immune Systems*. AFIT/GCO/ENG/12-02. Faculty Advisor: Dr. Angela A. Sodemann. Sponsor: 711 HPW/RH.

MACHUCA, JOHN P., *Streamlining the Change-Over Protocol for the RPA Mission Intelligence Coordinator by Way of Situation Awareness Oriented Design and Discrete Event Simulation*. AFIT/GSE/ENV/12-06. Faculty Advisor: Dr. Michael E. Miller. Sponsor: 711 HPW/RH.

MORALES, JUAN L., *Computer Aided Multi-Data Fusion Dismount Modeling*. AFIT/GE/ENG/12-29. Faculty Advisor: Lt Col Jeffrey D. Clark. Sponsor: 711 HPW/RH.

POND, TRAVIS J., *Discrete Event Simulation of Distributed Team Communication Architecture*. AFIT/GSE/ENV/12-M07. Faculty Advisor: Dr. Michael E. Miller. Sponsor: 711 HPW/RH.

ROSS, MATTHEW P., *Multi-Observation Continuous Density Hidden Markov Models for Anomaly Detection in Full Motion Video*. AFIT/GCS/ENG/12-07. Faculty Advisor: Lt Col Brett J. Borghetti. Sponsor: 711 HPW/RH.

WEBSTER, BRANDON M., *Implementing a Quantitative Analysis Design Tool for Future Generation Interfaces*. AFIT/GSE/ENV/12-M08. Faculty Advisor: Dr. John M. Colombi. Sponsor: 711 HPW/RH.

WEIMER, CHRISTOPHER W., *Forecasting Effects of Influence Operations: A Generative Social Science Methodology*. AFIT/OR-MS/ENS/12-26. Faculty Advisor: Dr. John O. Miller. Sponsor: 711 HPW/RH. [COA]

WOODDELL, DAVID R., *Probabilistic Model for Laser Damage to the Human Retina*. AFIT/OR-MS/ENS/12-30. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: 711 HPW/RH. [COA]

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

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

ENDERBY, JAMES C., *Comparative Analysis of Two Biological Warfare Air Samplers Using Live Surrogate Agents*. AFIT/GIH/ENV/12-M01. Faculty Advisor: Lt Col Dirk P. Yamamoto. Sponsor: 711 HPW/USAFSAM.

OPPENHEIMER, VAL, *Prototyping the Use of Dispersion Models to Predict Ground Concentrations During Burning of Deployed Military Waste*. AFIT/GEM/ENV/12-M16. Faculty Advisor: Lt Col Dirk P. Yamamoto. Sponsor: 711 HPW/USAFSAM.

## **AFRL: INFORMATION DIRECTORATE**

### **MASTER'S THESES**

ESPOSITO, STEPHEN J., *Analysis of Forensic Super Timelines*. AFIT/ICW/ENG/12-04. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: AFRL/RI.

FINDLEY, JONATHAN S., *A Decision Analysis Perspective on Multiple Response Robust Optimization*. AFIT/OR-MS/ENS/12-10. Faculty Advisor: Maj Matthew J. Robbins. Sponsor: AFRL/RI. [COA]

HAY, ANDREW F., *Forensic Memory Analysis for Apple OS X*. AFIT/GCO/ENG/12-17. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: AFRL/RI. [CCR]

MORABITO, DANIEL B., *Detecting Hardware-Assisted Hypervisor Rootkits within Nested Virtualized Environments*. AFIT/GCO/ENG/12-20. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: AFRL/RI. [CCR]

PACER, BENHUR E., *Process Flow Features as a Host-Based Event Knowledge Representation*. AFIT/GCS/ENG/12-06. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: AFRL/RI. [CCR]

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

### **DOCTORAL DISSERTATIONS**

LANGLEY, DERRICK, *Design, Fabrication and Testing of Tunable RF Meta-Atoms*. AFIT/DEE/ENG/12-04. Faculty Advisor: Dr. Ronald A. Coutu. Sponsor: AFRL/RX.

### **MASTER'S THESES**

CAMPBELL, JONATHON M., *Field Emission of Thermally Grown Carbon Nanostructures on Silicon Carbide*. AFIT/GE/ENG/12-06. Faculty Advisor: Maj Michael C. Pochet. Sponsor: AFRL/RX.

FARIS, STEPHEN I., *Development of a Radar-Frequency Metamaterial Measurement and Characterization Apparatus*. AFIT/GE/ENG/12-13. Faculty Advisor: Dr. Peter J. Collins. Sponsor: AFRL/RX.

HUMBER, NOEL A., *Design, Modeling, and Measurement of a Metamaterial Electromagnetic Field Concentrator*. AFIT/GE/ENG/12-22. Faculty Advisor: Dr. Peter J. Collins. Sponsor: AFRL/RX.

LU, QUAN-HAI T., *Durability of MWCNT Composites Under Electron and Neutron Irradiation*. AFIT/NUCL/ENP/12-M05. Faculty Advisor: Dr. John W. McClory. Sponsor: AFRL/RX.

OSPINA, FRANCISCO, *An Enhanced Fuselage Ultrasound Inspection Approach for ISHM Purposes*. AFIT/GSE/ENV/12-M12. Faculty Advisor: Dr. Som R. Soni. Sponsor: AFRL/RX.

PERRY, JOHN F., II, *The Impact of Supply Chain Business Processes on Competitive Advantage and Organizational Performance*. AFIT/LSCM/ENS/12-14. Faculty Advisor: Dr. William A. Cunningham. Sponsor: AFRL/RX. [COA]

POPE, MATTHEW T., *Creep Behavior in Interlaminar Shear of a CVI SiC/SiC Composite at Elevated Temperatures in Air and Steam*. AFIT/GMS/ENY/12-M02. Faculty Advisor: Dr. Marina B. Ruggles-Wrenn. Sponsor: AFRL/RX.

SALAZAR, RONALD M., *The Effect of Supply Chain Management Processes on Competitive Advantage and Organizational Performance*. AFIT/LSCM/ENS/12-16. Faculty Advisor: Dr. William A. Cunningham. Sponsor: AFRL/RX. [COA]

STEFFENS, BENJAMIN R., *Creep of Hi-Nicalon S Ceramic Fiber Tows at Elevated Temperature in Air and in Steam*. AFIT/GMS/ENY/12-M03. Faculty Advisor: Dr. Marina B. Ruggles-Wrenn. Sponsor: AFRL/RX.

WHITE, ANTHONELLI, *The Relationship Between Key Supply Chain Process Implementation, Competitive Advantage and Organizational Performance*. AFIT/LSCM/ENS/12-24. Faculty Advisor: Dr. William A. Cunningham. Sponsor: AFRL/RX. [COA]

## **AFRL: MUNITIONS DIRECTORATE**

### **DOCTORAL DISSERTATIONS**

EILDERS, MARTIN J., *Decentralized Riemannian Particle Filtering with Applications to Multi-Agent Localization*. AFIT/DEE/ENG/12-05. Faculty Advisor: Dr. John F. Raquet. Sponsor: AFRL/RW. [ANT]

### **MASTER'S THESES**

BEECHER, BRIAN D., & MITCHELL, ANTHONY C., *Application of Extended Sequence Modeling to Evaluate Concept Maturity Within a Stage-Gated Framework*. AFIT/GSE/ENV/12-M01. Faculty Advisor: Dr. David R. Jacques. Sponsor: AFRL/RW.

COX, JOHN L., *Computational Study of Shock Ignition Phenomenon*. AFIT/GAE/ENY/12-M07. Faculty Advisor: Dr. Robert B. Greendyke. Sponsor: AFRL/RW.

MITCHELL, ANTHONY C., See BEECHER, BRIAN D.

RELYEA, ANDREW L., *Covariance Analysis of Vision Aided Navigation by Bootstrapping*. AFIT/GE/ENG/12-36. Faculty Advisor: Dr. Meir Pachter. Sponsor: AFRL/RW. [ANT]

WOLF, SEAN E., *Modeling Small Unmanned Aerial System Mishaps Using Logistic Regression and Artificial Neural Networks*. AFIT/OR-MS/ENS/12-29. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: AFRL/RW. [COA]

## **AFRL: PROPULSION DIRECTORATE**

### **DOCTORAL DISSERTATIONS**

HUTZEL, JOHN R., *Scramjet Isolator Modeling and Control*. AFIT/DS/ENY/11-19. Faculty Advisor: Lt Col Douglas D. Decker. Sponsor: AFRL/RZ.

LEBAY, KENNETH D., *Characterization of Centrifugally-Loaded Flame Migration for Ultra-Compact Combustors*. AFIT/DS/ENY/11-22. Faculty Advisor: Dr. Marc D. Polanka. Sponsor: AFRL/RZ.

ROUSER, KURT P., *Unsteady Specific Work and Isentropic Efficiency of a Radial Turbine Driven by Pulsed Detonations*. AFIT/DS/ENY/12-25. Faculty Advisor: Dr. Paul I. King. Sponsor: AFRL/RZ.

### **MASTER'S THESES**

AUSSERER, JOSEPH K., *Integration, Testing, and Validation of a Small Hybrid-Electric Remotely-Piloted Aircraft*. AFIT/GAE/ENY/12-M02. Faculty Advisor: Lt Col Frederick G. Harmon. Sponsor: AFRL/RZ.

BUI, DUC M., *Plume Characterization of Busek 600W Hall Thruster*. AFIT/GA/ENY/12-M05. Faculty Advisor: Lt Col Richard E. Huffman. Sponsor: AFRL/RZ.

CAMARDO, LOUIS A., II, *Determination of Effective Crossover Location and Dimensions for Branched Detonation in a Pulsed Detonation Engine*. AFIT/GAE/ENY/12-M05. Faculty Advisor: Dr. Paul I. King. Sponsor: AFRL/RZ.

CROSBIE, STEVEN C., *Increasing Reliability of a Small 2-Stroke Internal Combustion Engine for Dynamically Changing Attitudes*. AFIT/GAE/ENY/12-M08. Faculty Advisor: Dr. Marc D. Polanka. Sponsor: AFRL/RZ.

DELALLO, MICHAEL R., *Impact of Trench and Ramp Film Cooling Designs to Reduce Heat Release Effects in a Reacting Flow*. AFIT/GAE/ENY/12-M10. Faculty Advisor: Dr. Marc D. Polanka. Sponsor: AFRL/RZ.

FEIGENBLATT, MICHAEL A., *FTIR Examination of Single Tank Storable Liquid Bi-Propellant Under Varied Pressure and Heat Conditions*. AFIT/GAE/ENY/12-M13. Faculty Advisor: Lt Col Carl R. Hartsfield. Sponsor: AFRL/RZ.

JOHNSON, DONALD D., *Cooling Requirements for the Ultra Compact Combustor*. AFIT/GAE/ENY/12-M25. Faculty Advisor: Dr. Marc D. Polanka. Sponsor: AFRL/RZ.

LIPSCOMB, MATTHEW R., *Optimization of CubeSat Attitude Control System and Propulsion Subsystems for Orbit Changes*. AFIT/GA/ENY/12-M11. Faculty Advisor: Col Timothy J. Lawrence. Sponsor: AFRL/RZ.

MOEN, MICHAEL D., *Methane Dual Expander Aerospike Nozzle Rocket Engine*. AFIT/GA/ENY/12-M12. Faculty Advisor: Lt Col Carl R. Hartsfield. Sponsor: AFRL/RZ.

PARKS, ADAM K., *Desensitizing Flame Structure and Exhaust Emissions to Flow Parameters in an Ultra-Compact Combustor*. AFIT/GAE/ENY/12-M33. Faculty Advisor: Dr. Marc D. Polanka. Sponsor: AFRL/RZ.

SMITH, BRANDON D., *Scaling Study of Wave Rotor Turbo-Normalization of a Small Internal Combustion Engine*. AFIT/GAE/ENY/12-S48. Faculty Advisor: Dr. Marc D. Polanka. Sponsor: AFRL/RZ.

TELLEFSEN, JONATHAN R., *Build Up and Operation of an Axial Turbine Driven by a Rotary Detonation Engine*. AFIT/GAE/ENY/12-M39. Faculty Advisor: Dr. Paul I. King. Sponsor: AFRL/RZ.

## **AFRL: SENSORS DIRECTORATE**

### **DOCTORAL DISSERTATIONS**

BRYANT, ADAM R., *Understanding How Reverse Engineers Make Sense of Programs from Assembly Language Representations*. AFIT/DCS/ENG/12-01. Faculty Advisor: Dr. Robert F. Mills. Sponsor: AFRL/RZ. [CCR]

CHRISTIANSEN, BRADLEY D., *Investigation of Gallium Nitride Transistor Reliability through Accelerated Life Testing and Modeling*. AFIT/DEE/ENG/11-04. Faculty Advisor: Dr. Ronald A. Coutu, Jr. Sponsor: AFRL/RZ.

GUTIERREZ DEL ARROYO, JOSE R., *Passive Synthetic Aperture Radar Imaging Using Commercial OFDM Communication Networks*. AFIT/DEE/ENG/12-10. Faculty Advisor: Dr. Julie A. Jackson. Sponsor: AFRL/RZ. [ANT]

KUCIAPINSKI, KEVIN S., *Operational Application of RF Distinct Native Attribute (RF-DNA) Fingerprinting to Commercial SATCOM Devices*. AFIT/DEE/ENG/12-15. Faculty Advisor: Dr. Michael A. Temple. Sponsor: AFRL/RZ. [CCR]

WELKER, TROY C., *Gravity Gradiometer Integrated Passive Precise Aircraft Navigation*. AFIT/DS/ENY/12-10. Faculty Advisor: Lt Col Richard E. Huffman. Sponsor: AFRL/RZ.

## MASTER'S THESES

- BADENHOP, CHRISTOPHER W., *A Black Hole Attack Model for Reactive Ad-Hoc Protocols*. AFIT/GCO/ENG/12-01. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: AFRL/R.Y. [CCR]
- BUTLER, MICHAEL S., *Low Cost, Low Complexity Sensor Design for Non-Cooperative Geolocation via Received Signal Strength*. AFIT/GE/ENG/12-05. Faculty Advisor: Dr. Richard K. Martin. Sponsor: AFRL/R.Y. [ANT]
- CASSEL, JERMEMKO S., *Characterization of Global Positioning Systems (GPS) Coexisting with Wideband and Narrowband Signals*. AFIT/GE/ENG/12-09. Faculty Advisor: Dr. Michael A. Temple. Sponsor: AFRL/R.Y. [ANT & CCR]
- COLE, LEE B., *Low Frequency Material Characterization of Thin Substrates in a Coaxial Transmission Line*. AFIT/GE/ENG/12-10. Faculty Advisor: Dr. Michael J. Havrilla. Sponsor: AFRL/R.Y.
- CORNN, PAUL A., *Spatial Identification of Passive Radio Frequency Identification Tags Using Software Defined Radios*. AFIT/GCE/ENG/12-04. Faculty Advisor: Maj Mark D. Silvius. Sponsor: AFRL/R.Y. [ANT]
- EKHOLM, JARED M., *3-D Scene Reconstruction from Aerial Imagery*. AFIT/APPLPHY/ENP/12-M03. Faculty Advisor: Lt Col Karl C. Walli. Sponsor: AFRL/R.Y. [CTISR]
- ENG, KWEE G., *Intelligent Behavioral Action Aiding for Improved Autonomous Image Navigation*. AFIT/GE/ENG/12-46. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: AFRL/R.Y. [ANT & CCR]
- FREEMAN, ANDREW M., *Dismount Threat Recognition Through Automatic Pose Identification*. AFIT/GE/ENG/12-14. Faculty Advisor: Lt Col Jeffrey D. Clark. Sponsor: AFRL/R.Y.
- HAGEN, JOHN T., *Vulnerability Analysis of the Player Command and Control Protocol*. AFIT/GCO/ENG/12-16. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: AFRL/R.Y. [CCR]
- HARDIN, RYAN L., *Magnetic Field Generation and B-Dot Sensor Characterization in the High Frequency Band*. AFIT/GE/ENG/12-20. Faculty Advisor: Lt Col Geoffrey A. Akers. Sponsor: AFRL/R.Y.
- HUFFMAN, MICHAEL A., *The Effects of Cognitive Jamming on Wireless Sensor Networks Used for Geolocation*. AFIT/GE/ENG/12-21. Faculty Advisor: Dr. Richard K. Martin. Sponsor: AFRL/R.Y. [ANT]
- KILLPACK, SHAWN O., *Radio Frequency Distinct Native Attribute (RF-DNA) Fingerprinting Applied to Commercial SATCOM Devices*. AFIT/GE/ENG/12-25. Faculty Advisor: Dr. Michael A. Temple. Sponsor: AFRL/R.Y. [CCR]
- KOZIEL, ERIC A., *Effects of Architecture on Information Leakage of a Hardware Advanced Encryption Standard Implementation*. AFIT/GCO/ENG/12-25. Faculty Advisor: Dr. Rusty O. Baldwin. Sponsor: AFRL/R.Y. [CCR]
- LOCKE, TIMOTHY P., *Improvements to Optical Communication Capabilities Achieved Through the Optical Injection of Semiconductor Lasers*. AFIT/GE/ENG/12-27. Faculty Advisor: Maj Michael C. Pochet. Sponsor: AFRL/R.Y.
- RAMSEY, JOHN C., *Electroluminescence Studies on Long Wavelength Indium Arsenide Quantum Dot Microcavities Grown on Gallium Arsenide*. AFIT/GE/ENG/11-46. Faculty Advisor: Dr. Ronald A. Coutu, Jr. Sponsor: AFRL/R.Y.
- RAPSON, MATTHEW B.P., *Passive Multistatic Radar Imaging Using an OFDM Based Signal of Opportunity*. AFIT/GE/ENG/12-35. Faculty Advisor: Julie A. Jackson. Sponsor: AFRL/R.Y. [ANT]



ROTH, BENJAMIN D., *LADAR Performance Simulations with a High Spectral Resolution Atmospheric Transmittance and Radiance Model-LEEDR*. AFIT/APPLPHY/ENP/12-M09. Faculty Advisor: Dr. Steven T. Fiorino. Sponsor: AFRL/RV. [CDE]

SCHNAPP, JAMIE P., *Linear-Quadratic Control of a MEMS Micromirror Using Kalman Filtering*. AFIT/GE/ENG/11-44. Faculty Advisor: Dr. Ronald A. Coutu, Jr. Sponsor: AFRL/RV.

SITTERLY, MARCUS A., *Electromagnetic Characterization of Inhomogeneous Media*. AFIT/GE/ENG/12-37. Faculty Advisor: Dr. Michael J. Havrilla. Sponsor: AFRL/RV.

SMITH, ANDREW R., *Rapid Development: A Content Analysis Comparison of Literature and Purposive Sampling of AFRL Rapid Reaction Projects*. AFIT/GRD/ENV/11D-01. Faculty Advisor: Dr. John M. Colombi. Sponsor: AFRL/RV.

STOUT, WILLIAM M.S., *Network Performance of Access Control Policies in a Tactical Environment*. AFIT/GCE/ENG/12-09. Faculty Advisor: Dr. Rusty O. Baldwin. Sponsor: AFRL/RV. [CCR]

SZUSTER, MATTHEW L., *A High Bandwidth Non-Destructive Method for Characterizing Simple Media*. Faculty Advisor: Dr. Michael J. Havrilla. Sponsor: AFRL/RV.

TRAN, TUAN U., *Unmanned Aerial Vehicle Flight Test Approval Process and its Implications: A Methodological Approach to Capture and Evaluate Hidden Costs and Value in the Overall Process*. AFIT/GRD/ENV/12-M04. Faculty Advisor: Lt Col Joseph R. Wirthlin. Sponsor: AFRL/RV.

VINCENT, OBA L., *Distributed Localization of Active Transmitters in a Wireless Sensor Network*. AFIT/GE/ENG/12-41. Faculty Advisor: Maj Mark D. Silvius. Sponsor: AFRL/RV. [ANT]

WALLIS, KRISTEN L., *An Inquiry: Effectiveness of the Complex Empirical Mode Decomposition Method, the Hilbert-Huang Transform, and the Fast-Fourier Transform for Analysis of Dynamic Objects*. AFIT/GE/ENG/12-42. Faculty Advisor: Dr. Andrew J. Terzuoli. Sponsor: AFRL/RV.

## **AFRL: SPACE VEHICLES DIRECTORATE**

### **MASTER'S THESES**

PADRO, JORGE G., *Development of a Star Tracker-Based Reference System for Accurate Attitude Determination of a Simulated Spacecraft*. AFIT/GAE/ENV/12-M32. Faculty Advisor: Dr. Eric D. Swenson. Sponsor: AFRL/RV. [ANT]

PLEISCH, JODIE J.E., *TeleTrak Image Processing*. AFIT/GA/ENV/12-M42. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: AFRL/RV.

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DINGER, REBECCA L., *Photometric Measurements for Satellite Identification Using Low Cost Telescopes and Imaging Sensors*. AFIT/GA/ENV/12-M07. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: AFRL/RV.

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SUTLIFF, JOSHUA T., *Small Aperture Photometry and Spectroscopy for Satellite Characterization and Identification*. AFIT/GA/ENV/12-M14. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: AFRL/RV.

WITTMAN, THOMAS M., *A Quantitative Analysis of Solar Flare Characteristics as Observed in the Solar Observing Optical Network and the Global Oscillation Network Group*. AFIT/APPLPHY/ENP/12-M11. Faculty Advisor: Lt Col Ariel O. Acebal. Sponsor: AFRL/RV.

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

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

CANCIANI, AARON J., *Integration of Cold Atom Interferometry INS with Other Sensors*. AFIT/GE/ENG/12-07. Faculty Advisor: Dr. John F. Raquet. Sponsor: AFSEO. [ANT]

FINSTER, KEVIN M., *Validation Testing of the Six Degree of Freedom Motion Model in Kestrel*. AFIT/GAE/ENY/12-J14. Faculty Advisor: Capt Christopher Martin. Sponsor: AFSEO.

#### **AIR FORCE TEST PILOT SCHOOL**

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

ONO, TOMOYUKI D., *Application of Multi-Input Multi-Output Feedback Control for F-16 Ventral Fin Buffet Alleviation Using Piezoelectric Actuators*. AFIT/GAE/ENY/12-M31. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: TPS.

#### **4.6. AIR MOBILITY COMMAND**

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

BREITBACH, TIMOTHY W., *Afghanistan Air Cargo Routing: An Inter/Intra-Theater Approach*. AFIT/LSCM/ENS/12-02. Faculty Advisor: Dr. Alan W. Johnson. Sponsor: AMC/A9. [COA]

GRANGER, AARON R., *An Analysis of C-17 Pilot Checklist Development, Control, and Effectiveness in Supporting Flight Operations*. AFIT/GSE/ENV/11-D03DL. Faculty Advisor: Dr. Michael E. Miller. Sponsor: AMC.

KINNE, JEREMY P., *The Effect of Multiple Interventions on Environmental Attitudes and Behaviors*. AFIT/GEM/ENV/12-M11. Faculty Advisor: Dr. Alfred E. Thal. Sponsor: AMC/60 CES & ACC/9 CES.

LARIMORE, JASON A., *Tanker Fuel Consolidation: Effects of Higher Fidelity Modeling on a Resilient Plan*. AFIT/LSCM/ENS/12-08. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: AMC/A9. [COA]

LEITER, MEGAN A., *Simulation Modeling and Analysis of the Impact of Individual Mobility Augmentee Loss at the Tanker Airlift Control Center*. AFIT/OR-MS/ENS/12-18. Faculty Advisor: Dr. John O. Miller. Sponsor: AMC/618 TACC. [COA]

WEITZ, MICHAEL T., *C-5M Super Galaxy Utilization with Joint Precision Airdrop System*. AFIT/LSCM/ENS/12-23. Faculty Advisor: Dr. Alan W. Johnson. Sponsor: AMC/A4. [COA]

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

ALEXANDER, MONA E., *The C-27J Spartan Procurement Program: A Case Study in USAF Sourcing Practices for National Security*. AFIT/IMO/ENS/12-01. Faculty Advisor: Dr. Alan R. Heminger. Sponsor: HQ AMC.

EPPLEY, JOEL E., *Optimizing Aircraft Utilization for Retrograde Operations*. AFIT/IMO/ENS/12-06. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: HQ AMC. [COA]

GONYEA, TIMOTHY M., *Planes, Trains and Automobiles: Savings Potential of Utilizing Multi-Modal Transport for Depositioning Cargo in the CONUS*. AFIT/IMO/ENS/12-07. Faculty Advisor: Dr. William A. Cunningham. Sponsor: HQ AMC. [COA]

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LYNCH, SARAH R., *Remotely Piloted Aircraft (RPA) Performing the Air Refueling Mission*. AFIT/IMO/ENS/12-08. Faculty Advisor: Dr. Alan R. Heminger. Sponsor: HQ AMC & HQ USAF/A5.

MANUEL, FREDERICK W., *A Cost-Benefit Analysis of Purchasing More C-27J Aircraft for Direct Support*. AFIT/IMO/ENS/12-09. Faculty Advisor: Dr. William A. Cunningham. Sponsor: HQ AMC. [COA]

OBERSON, FREDRIC M., *Analysis of CENTCOM Commercial Intra-Theater Airlift Costs*. AFIT/IMO/ENS/12-11. Faculty Advisor: Dr. William A. Cunningham. Sponsor: HQ AMC. [COA]

PURTLE, NATHAN R., *Modeling the 2008 Manning Study for the 618<sup>th</sup> Tanker Airlift Control Center (TACC)*. AFIT/ILS/ENS/12-05. Faculty Advisor: Dr. William A. Cunningham. Sponsor: AMC/618 TACC. [COA]

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## **4.7. AIR FORCE SPACE COMMAND**

### **MASTER'S THESES**

LUDOVICE, SMILE T., *Analysis of the Impact of Data Normalization on Cyber Event Correlation Query Performance*. AFIT/GIR/ENV/12-M03. Faculty Advisor: Dr. Michael R. Grimala. Sponsor: AFSPC.

### **GRADUATE RESEARCH PAPERS**

PRITCHETT, MICHAEL D., *Cyber Mission Assurance: A Guide to Reducing the Uncertainties of Operating in a Contested Cyber Environment*. AFIT/ICW/ENV/12-J01. Faculty Advisor: Dr. Michael R. Grimala. Sponsor: AFSPC.

## **SPACE AND MISSILE SYSTEMS CENTER**

### **MASTER'S THESES**

HANOKA, WESTON J., & RYAN, MICHAEL H., *A Study of Executable Model Based Systems Engineering from DODAF Using Simulink*. AFIT/GSE/ENV/12-S05DL. Faculty Advisor: Lt Col Brent T. Langhals. Sponsor: SMC.

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### **GRADUATE RESEARCH PAPERS**

MONTGOMERY, JONATHON A., *Expansion of Enterprise Requirements and Acquisition Model*. AFIT/ISE/ENV/12-J03. Faculty Advisor: Lt Col Joseph R. Wirthlin. Sponsor: SMC.

## **4.8. USAF FIELD OPERATING AGENCIES/DIRECT REPORTING UNITS**

### **AIR FORCE CENTER FOR ENGINEERING AND THE ENVIRONMENT**

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

DANAHER, ALEC C., *Incorporating Externalities and Uncertainty into Life-Cycle Cost Analysis*. AFIT/GEM/ENV/12-M02. Faculty Advisor: Dr. Alfred E. Thal. Sponsor: AFCEE.

JASZKOWIAK, LINDSAY M., *Firm Fixed Price and Cost Plus Fixed Fee Construction Contracts in Iraq and Afghanistan*. AFIT/GEM/ENV/12-M10. Faculty Advisor: Lt Col Peter P. Feng. Sponsor: AFCEE.

### **AIR FORCE CIVIL ENGINEER SUPPORT AGENCY**

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

GILMAN, JACOB M., *Simplified Daylight Spectrum Approximation by Blending Two Light Emitting Diode Sources*. AFIT/GEM/ENV/12-M06. Faculty Advisor: Dr. Michael E. Miller. Sponsor: AFCESA.

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### **AIR FORCE COST ANALYSIS AGENCY**

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

DRYLIE, SCOTT T., *Predictors and Predictive Effects of Attitudinal Inconsistency Towards Organizational Change*. AFIT/GCA/ENV/12-M04. Faculty Advisor: Lt Col John J. Elshaw. Sponsor: AFCAA.

### **AIR FORCE LOGISTICS MANAGEMENT AGENCY**

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

GLASSBURNER, AARON V., *Evaluation of Inventory Reduction Strategies: Balad Air Base Simulation Case Study*. AFIT/LSCM/ENS/12-05. Faculty Advisor: Dr. Kenneth W. Bauer. Sponsor: AFLMA. [COA]

## **AIR FORCE MEDICAL SUPPORT AGENCY**

### **MASTER'S THESES**

FLORY, JASON R., *Influence of pH on the Transport of Silver Nanoparticles in Saturated Porous Media: Laboratory Experiments and Modeling*. AFIT/GIH/ENV/12-M02. Faculty Advisor: Maj LeeAnn Racz. Sponsor: AFMSA.

WOODALL, BRIAN D., *Emissions from Simulated Open Burning of Deployed US Military Waste*. AFIT/GES/ENV/12-M05. Faculty Advisor: Lt Col Dirk P. Yamamoto. Sponsor: AFMSA.

## **AIR FORCE OFFICE OF SPECIAL INVESTIGATIONS**

### **GRADUATE RESEARCH PAPERS**

SWARTZMILLER, JUSTIN W., *Securing the Next Ripple in Information Security: The Defense Industrial Base (DIB)*. AFIT/ICW/ENV/12-J02. Faculty Advisor: Dr. Alan R. Heminger. Sponsor: AFOSI.

## **AIR NATIONAL GUARD READINESS CENTER**

### **GRADUATE RESEARCH PAPERS**

NASMAN, JAMES M., *A Linear Regression Model Identifying the Primary Factors Contributing to Maintenance Man Hours for the C-17 Globemaster III in the Air National Guard*. AFIT/IMO/ENS/12-10. Faculty Advisor: Lt Col Shay R. Capehart. Sponsor: ANGRC.

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

### **DOCTORAL DISSERTATIONS**

MINDRUP, FRANCIS M., *Optimizing Hyperspectral Imagery Anomaly Detection Algorithms through Improved Robust Parameter Design Techniques*. AFIT/DS/ENS/11-04. Faculty Advisor: Dr. Kenneth W. Bauer. Sponsor: NASIC. [COA]

MORRIS, JAMES F., *A Quantitative Methodology for Vetting "Dark Network" Intelligence Sources for Social Network Analysis*. AFIT/DS/ENS/12-05. Faculty Advisor: Dr. Richard F. Deckro. Sponsor: NASIC.

STEWART, BRYAN J., *Characterization and Discrimination of Large Caliber Gun Blast and Flash Signatures*. AFIT/DS/ENP/11-D01. Faculty Advisor: Dr. Glen P. Perram. Sponsor: NASIC. [CTISR]

### **MASTER'S THESES**

BUSH, KELLY R., *Using QR Factorization for Real-Time Anomaly Detection of Hyperspectral Images*. AFIT/OR-MS/ENS/12-04. Faculty Advisor: Dr. Kenneth W. Bauer. Sponsor: NASIC. [COA]

FRIESEN, KELLY D., *Automatic Target Recognition for Hyperspectral Imagery*. AFIT/OR-MS/ENS/12-11. Faculty Advisor: Dr. Kenneth W. Bauer. Sponsor: NASIC. [COA]

GUZMAN, JOSHUA D., *Analysis of Social Network Measures with Respect to Structural Properties of Networks*. AFIT/OR-MS/ENS/12-12. Faculty Advisor: Dr. Richard F. Deckro. Sponsor: NASIC.

MACDERMOTT, ROBERT B., *An Aerothermal Analysis of a Maneuverable Reentry Body*. AFIT/GAE/ENY/12-M28. Faculty Advisor: Dr. Robert B. Greendyke. Sponsor: NASIC.

OLIVER, JEREMY S., *Timing Variations in a Magnetic Pulse Compression Circuit*. AFIT/GE/ENG/12-31. Faculty Advisor: Dr. Andrew J. Terzuoli. Sponsor: NASIC.

WILKERSON, BENJAMIN P., *Development of Air Radiation Modeling for Hypersonic Vehicles*. AFIT/GAE/ENY/12-M41. Faculty Advisor: Dr. Robert B. Greendyke. Sponsor: NASIC.

#### **UNITED STATES AIR FORCE ACADEMY**

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

BLACKSTUN, MARGARET, *Analysis of a CubeSat Imaging Mission FalconSAT-7*. AFIT/GA/ENY/12-M04. Faculty Advisor: Dr. Eric D. Swenson. Sponsor: USAFA.

#### **4.9. DEPARTMENT OF DEFENSE**

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

FOERTSCH, MATTHEW T., *Enhanced Warhead Lethality by Use of Directional Explosively Formed Projectiles*. AFIT/GAE/ENY/12-M16. Faculty Advisor: Lt Col Richard E. Huffman. Sponsor: JASPO.

SIEVERS, KATHERINE W., *Modeling the Impact of Cracking in Low Permeability Layers in a Groundwater Contamination Source Zone on Dissolved Contamination Fate and Transport*. AFIT/GES/ENV/12-M02. Faculty Advisor: Dr. Mark N. Goltz. Sponsor: SERDP.

#### **DEFENSE THREAT REDUCTION AGENCY**

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

MCQUARY, THOMAS P., *Neutron Detection Using Amorphous Boron-Carbide Hetero-Junction Diodes*. AFIT/NUCL/ENP/12-M06. Faculty Advisor: Dr. John W. McClory. Sponsor: DTRA.

#### **DEFENSE ADVANCED RESEARCH PROJECTS AGENCY**

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

JURADO, JUAN D., *Enhanced Image-Aided Navigation Algorithm with Automatic Calibration and Affine Distortion Prediction*. AFIT/GE/ENG/12-23. Faculty Advisor: Lt Col Kenneth A. Fisher. Sponsor: DARPA. [ANT]

PENN, TIMOTHY R., *All Source Sensor Integration Using an Extended Kalman Filter*. AFIT/GE/ENG/12-32. Faculty Advisor: Dr. John F. Raquet. Sponsor: DARPA. [ANT]

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

##### **DOCTORAL DISSERTATIONS**

BROWN, KIRK C., *Collisional Dynamics, Lasing and Simulated Raman Scattering in Optically Pumped Cesium and Potassium Vapors*. AFIT/DS/ENP/12-M01. Faculty Advisor: Dr. Glen P. Perram. Sponsor: HELJTO. [CDE]

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

BURCHETT, LEE R., *Turbulence Measurement in the Atmospheric Boundary Layer Using Cellular Telephone Signals*. AFIT/APPLPHY/ENP/12-M01. Faculty Advisor: Dr. Steven T. Fiorino. Sponsor: HELJTO. [CDE]

BURLEY, JARRED L., *Comparison of High Energy Laser Expected Dwell Times and Probability of Kill for Mission Planning Scenarios in Actual and Standard Atmosphere*. AFIT/APPLPHY/ENP/12-M02. Faculty Advisor: Dr. Steven T. Fiorino. Sponsor: HELJTO. [CDE]

LOTT, GORDON E., *Cesium Absorption Spectrum Perturbed by Argon: Observation of Non-Lorentzian Far Wings*. AFIT/APPLPHY/ENP/12-M08. Faculty Advisor: Dr. Glen P. Perram. Sponsor: HELJTO. [CDE]

SCHOFIELD, JOSEPH C., *Mapping Nuclear Fallout Using the Weather Research and Forecasting (WRF) Model*. AFIT/CWMD/ENP/12-S01. Faculty Advisor: Dr. Steven T. Fiorino. Sponsor: HELJTO. [CDE]

## **NATIONAL SECURITY AGENCY**

### **DOCTORAL DISSERTATIONS**

COBB, WILLIAM E., *Exploitation of Unintentional Information Leakage from Integrated Circuits*. AFIT/DEE/ENG/11-06. Faculty Advisor: Dr. Rusty O. Baldwin. Sponsor: NSA. [CCR]

### **MASTER'S THESES**

ADAMS, THOMAS C., *Empirical Analysis of Optical Attenuator Performance in Quantum Key Distribution Systems Using a Particle Model*. AFIT/GCS/ENG/12-01. Faculty Advisor: Lt Col Jeffrey W. Humphries. Sponsor: LTS. [CCR]

CRAWFORD, MARTIN H., *Insider Threat Detection on the Windows Operating System Using Virtual Machine Introspection*. AFIT/GCO/ENG/12-15. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: NSA. [CCR]

HARPER, CAROLE A., *Security Standards and Best Practice Considerations for Quantum Key Distribution (QKD)*. AFIT/GSE/ENV/12-M05. Faculty Advisor: Dr. Michael R. Grimala. Sponsor: LTS.

JOHNSON, JAMES S., *An Analysis of Error Reconciliation Protocols for Use in Quantum Key Distribution*. AFIT/GCE/ENG/12-06. Faculty Advisor: Lt Col Jeffrey W. Humphries. Sponsor: LTS. [CCR]

SORENSEN, NATHANIEL T., *Quantum Channel Modeling for Discrete Event Simulation of Quantum Key Distribution*. AFIT/APPLPHY/ENV/12-M01. Faculty Advisor: Dr. Michael R. Grimala. Sponsor: LTS.

## **OFFICE OF THE SECRETARY OF DEFENSE**

### **DOCTORAL DISSERTATIONS**

RYAN, ERIN T., *Cost-Based Decision Model for Valuing System Design Options*. AFIT/DS/ENV/12-01. Faculty Advisor: Dr. David R. Jacques. Sponsor: OSD.

### **MASTER'S THESES**

CHAMBERLAIN, CHAD N., *Analysis of KC-46 Live-Fire Risk Mitigation Program Testing*. AFIT/OR-MS/ENS/12-06. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: OSD. [COA]

CHRISTENSEN, MATTHEW B., *A Method for Measuring Programmatic Dependency and Interdependency Between DOD Acquisition Programs*. AFIT/GSE/ENV/11-D02DL. Faculty Advisor: Lt Col Joseph R. Wirthlin. Sponsor: OSD.

DELLOLAcono, BRAD M., *Remotely Piloted Aircraft (RPA) System of Systems (SOS): Wave Model Application and Analysis*. AFIT/GSE/ENV/12-J03DL. Faculty Advisor: Dr. John M. Colombi. Sponsor: OSD.

DOWLING, AUSTIN W., *Using Predictive Analytics to Detect Major Problems in Department of Defense Acquisition Programs*. AFIT/GCA/ENC/12-03. Faculty Advisor: Dr. Edward D. White. Sponsor: OSD.

ENGLISH, JACOB K., & MOLESWORTH, MICHAEL P., *Rapid Prototype Development of a Remotely-Piloted Aircraft Powered by a Hybrid-Electric Propulsion System*. AFIT/GSE/ENV/12-M02. Faculty Advisor: Dr. David R. Jacques. Sponsor: OSD. [ANT]

GIACOMO, CHRISTOPHER, *Modeling, Simulation and Flight Test for Automatic Flight Control of the Condor Hybrid-Electric Remote Piloted Aircraft*. AFIT/GSE/ENV/12-M04. Faculty Advisor: Dr. David R. Jacques. Sponsor: OSD. [ANT]

MILLER, TREVOR P., *Acquisition Program Detection Using Text Mining Methods*. AFIT/GCA/ENC/12-02. Faculty Advisor: Dr. Edward D. White. Sponsor: OSD.

MOLESWORTH, MICHAEL P., See ENGLISH, JACOB K.

STORM, SCOTT M., *Evaluating Aerial Refueling Simulator Validation Test Designs by Extending Response Surface Methodology to Analyze Time History Responses*. AFIT/OR-MS/ENS/12-25. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: OSD. [COA]

WEIBLEN, JARRETT L., *The Effects of Deployments and Other Factors on Air Force Junior Officer Retention*. AFIT/LSCM/ENS/12-22. Faculty Advisor: Dr. Darryl K. Ahner. Sponsor: OSD. [COA]

## **UNITED STATES ARMY**

### **MASTER'S THESES**

KLAUSNER, ANDREW J., *Improved Weaponeering Solutions Through Analyzing the Effect of GPS-Jamming on the Accuracy of Precision Guided Munitions*. AFIT/GAE/ENY/12-M26. Faculty Advisor: Lt Col Richard E. Huffman. Sponsor: AMSAA.

SHACKELFORD, WILLIAM C., II, *Analysis of the Effects of Target Motion on Delivery Accuracy for the Improvement of Weaponeering Tools*. AFIT/GAE/ENY/12-M35. Faculty Advisor: Dr. Robert B. Greendyke. Sponsor: AMSAA.

SAIE, CADE M., *Understanding the Instruments of National Power Through a System of Differential Equations in a Counterinsurgency*. AFIT/GSE/ENS/12-01. Faculty Advisor: Dr. Darryl K. Ahner. Sponsor: CAA. [COA]

### **GRADUATE RESEARCH PAPERS**

LEE, JORDAN D., *The Comparison of Strategies Used in the Game of RISK via Markovian Analysis and Monte-Carlo Simulation*. AFIT/IOA/ENS/12-02. Faculty Advisor: Dr. James W. Chrissis. Sponsor: CAA & ASC. [COA]

## **UNITED STATES NAVY**

### **MASTER'S THESES**

MCPHERSON, ANDREW W.E., *Optimization of Nanoscale Zero-Valent Iron for the Remediation of Groundwater Contaminants*. AFIT/GES/ENV/12-M01. Faculty Advisor: Dr. Mark N. Goltz. Sponsor: NFESC.

STEVENS, TODD J., *Stabilizing Acetylcholinesterase on Carbon Electrodes Using Peptide Nanotubes to Produce Effective Biosensors*. AFIT/GES/ENV/12-M03. Faculty Advisor: Dr. Mark N. Goltz. Sponsor: NFESC.



## **UNITED STATES PACIFIC COMMAND**

### **MASTER'S THESES**

JESSUP, MEREDITH A., II, *Using Hybrid Simulation/Analytical Queuing Networks to Capacitate USAF Air Mobility Command Passenger Terminals*. AFIT/OR-MS/ENS/12-14. Faculty Advisor: Dr. Jeffrey K. Cochran. Sponsor: USPACOM. [COA]

## **UNITED STATES STRATEGIC COMMAND**

### **DOCTORAL DISSERTATIONS**

COTTRILL, GERALD C., *Hybrid Solution of Stochastic Optimal Control Problems Using Gauss Pseudospectral Method and Generalized Polynomial Chaos Algorithms*. AFIT/DS/ENY/12-11. Faculty Advisor: Lt Col Frederick G. Harmon. Sponsor: USSTRATCOM.

### **MASTER'S THESES**

FITZGERALD, JACK G., *A Programmable Liquid Collimator for Both Coded Aperture Adaptive Imaging and Multiplexed Compton Scatter Tomography*. AFIT/NUCL/ENP/12-M01. Faculty Advisor: Dr. Larry W. Burggraf. Sponsor: USSTRATCOM.

FORYSTEK, RYAN M., *A Revolutionary Approach to Strategic Aircraft Survivability Planning Through On-Demand Simulation*. AFIT/GAE/ENY/12-M17. Faculty Advisor: Lt Col Richard E. Huffman. Sponsor: USSTRATCOM.

GAUNTT, RYAN D., *Aircraft Course Optimization Tool Using GPOPS MATLAB Code*. AFIT/GSE/ENV/12-M03. Faculty Advisor: Dr. David R. Jacques. Sponsor: USSTRATCOM.

## **UNITED STATES TRANSPORTATION COMMAND**

### **DOCTORAL DISSERTATIONS**

HARTLAGE, ROBERT B., *Rough-Cut Capacity Planning in Multimodal Freight Transportation Networks*. AFIT/DS/ENS/12-03. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: USTRANSCOM. [COA]

JORDAN, JEREMY D., *The Average Network Flow Problem: Shortest Path and Minimum Cost Flow Formulations, Algorithms, Heuristics and Complexity*. AFIT/DS/ENS/12-09. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: USTRANSCOM. [COA]

### **MASTER'S THESES**

FISHER, RYAN S., *A Simulation to Evaluate Joint Military Logistics in a Humanitarian Assistance Environment*. AFIT/LSCM/ENS/12-04. Faculty Advisor: Dr. William A. Cunningham. Sponsor: USTRANSCOM. [COA]

SAYLAM, SERHAT, *A Spreadsheet Model that Estimates the Impact of Reduced Distribution Time on Inventory Investment Savings: What is a Day Taken Out of the Pipeline Worth in Inventory?* AFIT/LSCM/ENS/12-17. Faculty Advisor: Dr. William A. Cunningham. Sponsor: TuAF & USTRANSCOM. [COA]

### **GRADUATE RESEARCH PAPERS**

DEYOUNG, DANIEL S., *Time Series Forecasting of Airlift Sustainment Cargo Demand*. AFIT/IMO/ENS/12-05. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: USTRANSCOM. [COA]

## **4.10. OTHER FEDERAL AGENCIES**

### **ENVIRONMENTAL PROTECTION AGENCY**

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

SCHULDT, STEVEN J., *Biodegradation of Organophosphate Chemical Warfare Agents by Activated Sludge*. AFIT/GES/ENV/12-M04. Faculty Advisor: Maj LeeAnn Racz. Sponsor: EPA.

### **DEPARTMENT OF ENERGY**

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

ANDREWS, SEAN T., *An Analysis of Department of Energy Office of Environmental Management Project Cost Performance Using Logistic Regression*. AFIT/GCA/ENV/12-M01. Faculty Advisor: Dr. Timothy S. Reed. Sponsor: DOE.

YOUD, DAVID J., *A Nonparametric Statistical Analysis of Department of Energy Office of Environmental Management Project Cost Performance*. AFIT/GCA/ENV/12-M07. Faculty Advisor: Dr. Timothy S. Reed. Sponsor: DOE.

### **DEPARTMENT OF HOMELAND SECURITY**

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

BERMAN, DUSTIN, *Emulating Industrial Control System Field Devices Using Gumstix Technology*. AFIT/GCO/ENG/12-13. Faculty Advisor: Maj Jonathan W. Butts. Sponsor: DHS. [CCR]

BUSHEY, HENRY W., *Towards Quantifying Programmable Logic Controller Resilience Against Intentional Exploits*. AFIT/GCO/ENG/12-03. Faculty Advisor: Maj Jonathan W. Butts. Sponsor: DHS. [CCR]

GEARHART, JOEL S., *Investigation of BCF-12 Plastic Scintillating Coherent Fiber Bundle Timing Properties*. AFIT/NUCL/ENP/12-M02. Faculty Advisor: Maj Benjamin R. Kowash. Sponsor: DHS.

LARKIN, ROBERT D., *Evaluation of Traditional Security Solutions in the SCADA Environment*. AFIT/GCO/ENG/12-06. Faculty Advisor: Maj Jonathan W. Butts. Sponsor: DHS. [CCR]

MCMINN, LUCILLE R., *External Verification of SCADA System Embedded Controller Firmware*. AFIT/GCS/ENG/12-02. Faculty Advisor: Maj Jonathan W. Butts. Sponsor: DHS. [CCR]

### **NATIONAL AERONAUTICS AND SPACE ADMINISTRATION**

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

HATCH, ANGELA B., *Electrospray Propulsion Interface and Mission Modeling for CubeSats*. AFIT/GA/ENY/12-S47. Faculty Advisor: Dr. Jonathan T. Black. Sponsor: JPL.

EMMONS, DANIEL J., *Ensemble Forecasting of Coronal Mass Ejections Using the WSA-ENLIL with Coned Model*. AFIT/APPLPHY/ENP/12-M04. Faculty Advisor: Lt Col Ariel O. Acebal. Sponsor: NASA.

LANE, CORY T., *Comparative Statistical Analysis of Auroral Models*. AFIT/APPLPHY/ENP/12-M07. Faculty Advisor: Lt Col Ariel O. Acebal. Sponsor: NASA.

## **4.11. NON-FEDERAL SPONSORS**

### **ARGENTINE AIR FORCE**

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

STAHL, GUILLERMO A., *An Evaluation of the Argentinean Basic Trainer Aircraft Domestic Development Project*. AFIT/LSCM/ENS/12-19. Faculty Advisor: Maj Daniel D. Mattioda. Sponsor: Argentine Air Force. [COA]

### **BRAZILIAN AIR FORCE**

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

LOPES, JULIO C.O., *An Application of Course Scheduling in the Brazilian Air Force*. AFIT/LSCM/ENS/12-09. Faculty Advisor: Dr. Richard F. Deckro. Sponsor: Brazilian Air Force.

### **CHESAPEAKE ENERGY**

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

UZ, VEYSEL, *CNG as a Feasible Replacement for the U.S. Transportation Sector*. AFIT/LSCM/ENS/12-21. Faculty Advisor: Lt Col Bradley E. Anderson. Sponsor: Chesapeake Energy. [COA]

### **CHILEAN AIR FORCE**

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

GARRIDO, FELIPE E., *OFDM-Based Signal Exploitation Using Quadrature Mirror Filter Bank (QMFB) Processing*. AFIT/GE/ENG/12-16. Faculty Advisor: Dr. Michael A. Temple. Sponsor: Chilean Air Force.

### **MASSACHUSETTS INSTITUTE OF TECHNOLOGY LINCOLN LABORATORY**

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

BARBARO, SAMUEL P., *Satellite Relative Motion Control for MIT's SPHERES Program*. AFIT/GA/ENY/12-M02. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: MIT.

### **MULTISCALE DESIGN SYSTEM, LLC**

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

HADSALL, KEVIN A., *Inelastic Deformation Behavior of an MVK-14-Based Composite: Experiment and Modeling*. AFIT/GAE/ENY/12-M20. Faculty Advisor: Dr. Marina B. Ruggles-Wrenn. Sponsor: Multiscale Design System, LLC & AFOSR.

### **REPUBLIC OF KOREA AIR FORCE**

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

KIM, JAEBUM, *Decision Analysis Using Value-Focused Thinking for Retention of Long-Term Officers in the Korean Army*. AFIT/OR-MS/ENS/12-15. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: ROKAF. [COA]

## **SPECTRAL SCIENCES, INC.**

### **MASTER'S THESES**

RHOBY, MICHAEL R., *Application of an Imaging Fourier-Transform Spectrometer for the Means of Combustion Diagnostics*. AFIT/OSE/ENP/12-J02. Faculty Advisor: Dr. Kevin C. Gross. Sponsor: Spectral Sciences, Inc.

## **TAU ZERO FOUNDATION**

### **MASTER'S THESES**

DAVIS, BERKLEY R., *Gravitational Lens: Deep Space Probe Design*. AFIT/GA/ENY/12-M06. Faculty Advisor: Col Timothy J. Lawrence. Sponsor: Tau Zero Foundation.

## **TURKISH AIR FORCE**

### **MASTER'S THESES**

BENGOZ, AHMET, *Using VFT as a Constraint for Goal Programming Models: A Case Study for Turkish Air Force Flying Hour Program*. AFIT/OR-MS/ENS/12-01. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: TuAF. [COA]

BENGOZ, EMEL, *Value Focused Thinking in Developing Aerobatic Aircraft Selection Model for Turkish Air Force*. AFIT/OR-MS/ENS/12-02. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: TuAF. [COA]

SAYLAM, SERHAT, *A Spreadsheet Model that Estimates the Impact of Reduced Distribution Time on Inventory Investment Savings: What is a Day Taken Out of the Pipeline Worth in Inventory?* AFIT/LSCM/ENS/12-17. Faculty Advisor: Dr. William A. Cunningham. Sponsor: TuAF & USTRANSCOM. [COA]

SENAY, NURDINC, *The Strategic Level Optimization of Air to Ground Missiles for Turkish Air Force Decision Support System*. AFIT/OR-MS/ENS/12-23. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: TuAF. [COA]

YUKSELEN, KORHAN G., *An Assessment Tool of Performance Based Logistics Appropriateness*. AFIT/LSCM/ENS/12-25. Faculty Advisor: Dr. Jeffrey A. Ogden. Sponsor: TuAF. [COA]

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

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

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

Fax: 937-656-7621, DSN 986-7621

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

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### 5.1.1. DOCTORAL DISSERTATIONS

- CESUL, BRANDON T., *Investigation into Suitability of Geopolymers (Illite & Metakaolin) for the Space Environment*. AFIT/DS/ENY/12-14. Faculty Advisor: Dr. Shankar Mall. Sponsor: N/A.
- CO, THOMAS, C., *Operationally Responsive Spacecraft Using Electric Propulsion*. AFIT/DS/ENY/12-01. Faculty Advisor: Dr. Jonathan T. Black. Sponsor: N/A.
- COTTRILL, GERALD C., *Hybrid Solution of Stochastic Optimal Control Problems Using Gauss Pseudospectral Method and Generalized Polynomial Chaos Algorithms*. AFIT/DS/ENY/12-11. Faculty Advisor: Lt Col Frederick G. Harmon. Sponsor: USSTRATCOM.
- HUTZEL, JOHN R., *Scramjet Isolator Modeling and Control*. AFIT/DS/ENY/11-19. Faculty Advisor: Lt Col Douglas D. Decker. Sponsor: AFRL/RZ.
- KOLSTI, KYLE F., *Novel Discretization Schemes for the Numerical Simulation of Membrane Dynamics*. AFIT/DS/ENY/12-03. Faculty Advisor: Dr. Donald L. Kunz. Sponsor: AFOSR.
- LEBAY, KENNETH D., *Characterization of Centrifugally-Loaded Flame Migration for Ultra-Compact Combustors*. AFIT/DS/ENY/11-22. Faculty Advisor: Dr. Marc D. Polanka. Sponsor: AFRL/RZ.
- MARTIN, CHRISTOPHER L., JR., *Coupled Radiation-Gasdynamic Solution Method for Hypersonic Shock Layers in Thermochemical Nonequilibrium*. AFIT/DS/ENY/11-16. Faculty Advisor: Dr. Robert B. Greendyke. Sponsor: AFOSR.
- O'HARA, RYAN P., *The Characterization of Material Properties and Structural Dynamics of the Manduca Sexta Forewing for Application to Flapping Wing Micro Air Vehicle Design*. AFIT/DS/ENY/12-06. Faculty Advisor: Dr. Anthony N. Palazotto. Sponsor: AFOSR & AFRL/RB.
- ROUSER, KURT P., *Unsteady Specific Work and Isentropic Efficiency of a Radial Turbine Driven by Pulsed Detonations*. AFIT/DS/ENY/12-25. Faculty Advisor: Dr. Paul I. King. Sponsor: AFRL/RZ.
- RYTHER, CHAD E.C., *The Effect of Elevated Temperature on the Inelastic Deformation Behavior of PMR-15 Solid Polymer*. AFIT/DS/ENY/12-12. Faculty Advisor: Dr. Marina B. Ruggles-Wrenn. Sponsor: AFOSR.
- WELKER, TROY C., *Gravity Gradiometer Integrated Passive Precise Aircraft Navigation*. AFIT/DS/ENY/12-10. Faculty Advisor: Lt Col Richard E. Huffman. Sponsor: AFRL/RZ.

### 5.1.2. MASTER'S THESES

- ALMODOVAR, GABRIEL, *Material Characterization for Composite Materials in Load Bearing Wave Guides*. AFIT/GAE/ENY/12-M01. Faculty Advisor: Dr. Anthony N. Palazotto. Sponsor: AFRL/RB.
- ANDREWS, BLYTHE A., *A Colony II CubeSat Mission Modeling Tool*. AFIT/GA/ENY/12-M01. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: N/A.
- AUSSERER, JOSEPH K., *Integration, Testing, and Validation of a Small Hybrid-Electric Remotely-Piloted Aircraft*. AFIT/GAE/ENY/12-M02. Faculty Advisor: Lt Col Frederick G. Harmon. Sponsor: AFRL/RZ.
- BANNACH, DANE M., *Improved Satellite Detection by Doppler Shifted Signals Off of the Air Force Space Surveillance System*. AFIT/GA/ENY/12-M43. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: N/A.
- BARBARO, SAMUEL P., *Satellite Relative Motion Control for MIT's SPHERES Program*. AFIT/GA/ENY/12-M02. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: MIT.

BLACKSTUN, MARGARET, *Analysis of a CubeSat Imaging Mission FalconSAT-7*. AFIT/GA/ENY/12-M04. Faculty Advisor: Dr. Eric D. Swenson. Sponsor: USAFA.

BREWER, MEGAN R., *CubeSat Attitude Determination and Helmholtz Cage Design*. AFIT/GAE/ENY/12-M03. Faculty Advisor: Dr. Eric D. Swenson. Sponsor: N/A.

BUI, DUC M., *Plume Characterization of Busek 600W Hall Thruster*. AFIT/GA/ENY/12-M05. Faculty Advisor: Lt Col Richard E. Huffman. Sponsor: AFRL/RZ.

BUTLER, JEDEDIAH H., *Accurate Modeling of Stability and Control Properties for Fighter Aircraft from CFD*. AFIT/GAE/ENY/12-M04. Faculty Advisor: Maj Andrew J. Lofthouse. Sponsor: AFMC/46 SK.

CAMARDO, LOUIS A., II, *Determination of Effective Crossover Location and Dimensions for Branched Detonation in a Pulsed Detonation Engine*. AFIT/GAE/ENY/12-M05. Faculty Advisor: Dr. Paul I. King. Sponsor: AFRL/RZ.

CARMER, JOSHUA C., *Design, Integration and Test of the ALICE CubeSat Space and Ground Segments*. AFIT/GSS/ENY/12-M03. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: N/A.

CHENERY, MICHAEL G., *Computational Analysis and Characterization of RC-135 External Aerodynamics*. AFIT/GAE/ENY/12-M06. Faculty Advisor: Maj Andrew J. Lofthouse. Sponsor: ASC.

COX, JOHN L., *Computational Study of Shock Ignition Phenomenon*. AFIT/GAE/ENY/12-M07. Faculty Advisor: Dr. Robert B. Greendyke. Sponsor: AFRL/RW.

CROSBIE, STEVEN C., *Increasing Reliability of a Small 2-Stroke Internal Combustion Engine for Dynamically Changing Attitudes*. AFIT/GAE/ENY/12-M08. Faculty Advisor: Dr. Marc D. Polanka. Sponsor: AFRL/RZ.

DAVIS, BERKLEY R., *Gravitational Lens: Deep Space Probe Design*. AFIT/GA/ENY/12-M06. Faculty Advisor: Col Timothy J. Lawrence. Sponsor: Tau Zero Foundation.

DELALLO, MICHAEL R., *Impact of Trench and Ramp Film Cooling Designs to Reduce Heat Release Effects in a Reacting Flow*. AFIT/GAE/ENY/12-M10. Faculty Advisor: Dr. Marc D. Polanka. Sponsor: AFRL/RZ.

DINGER, REBECCA L., *Photometric Measurements for Satellite Identification Using Low Cost Telescopes and Imaging Sensors*. AFIT/GA/ENY/12-M07. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: AFRL/RV.

ELGERSMA, JAMES R., *Conceptual Layout of Wing Structure Using Topology Optimization for Morphing Micro Air Vehicles in a Perching Maneuver*. AFIT/GAE/ENY/12-M11. Faculty Advisor: Dr. Donald L. Kunz. Sponsor: AFRL/RB.

FAIDI, ANIS, *Effect of Accessory Power Take-Off Variation on a Turbofan Engine Performance*. AFIT/GAE/ENY/12-S26. Faculty Advisor: Dr. Paul I. King. Sponsor: N/A.

FEIGENBLATT, MICHAEL A., *FTIR Examination of Single Tank Storable Liquid Bi-Propellant Under Varied Pressure and Heat Conditions*. AFIT/GAE/ENY/12-M13. Faculty Advisor: Lt Col Carl R. Hartsfield. Sponsor: AFRL/RZ.

FINSTER, KEVIN M., *Validation Testing of the Six Degree of Freedom Motion Model in Kestrel*. AFIT/GAE/ENY/12-J14. Faculty Advisor: Capt Christopher Martin. Sponsor: AFSEO.

FLORA, THOMAS J., *Freedrop Testing and CFD Simulation of Ice Models from a Cavity into Supersonic Flow*. AFIT/GAE/ENY/12-S15. Faculty Advisor: Dr. Mark F. Reeder. Sponsor: AFRL/RB.



FOERTSCH, MATTHEW T., *Enhanced Warhead Lethality by Use of Directional Explosively Formed Projectiles*. AFIT/GAE/ENY/12-M16. Faculty Advisor: Lt Col Richard E. Huffman. Sponsor: JASPO.

FORYSTEK, RYAN M., *A Revolutionary Approach to Strategic Aircraft Survivability Planning Through On-Demand Simulation*. AFIT/GAE/ENY/12-M17. Faculty Advisor: Lt Col Richard E. Huffman. Sponsor: USSTRATCOM.

GOODSON, MATTHEW N., *Applications of Aerodynamic Forces for Spacecraft Orbit Maneuverability in Operationally Responsive Space and Space Reconstitution Needs*. AFIT/GA/ENY/12-M09. Faculty Advisor: Dr. Jonathan T. Black. Sponsor: N/A.

GRESHAM, JAMES L., *Optical Closed-Loop Control Tracking with Commercial Telescopes*. AFIT/GAE/ENY/12-M19. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: N/A.

HADSALL, KEVIN A., *Inelastic Deformation Behavior of an MVK-14-Based Composite: Experiment and Modeling*. AFIT/GAE/ENY/12-M20. Faculty Advisor: Dr. Marina B. Ruggles-Wrenn. Sponsor: Multiscale Design System, LLC & AFOSR.

HARRINGTON, RYAN C., *Final Design and Integration of the Alice CubeSat Mission*. AFIT/GSS/ENY/12-M04. Faculty Advisor: Dr. Jonathan T. Black. Sponsor: N/A.

HARTBERGER, JEFFERY E., *Background-Oriented Schlieren Pattern Optimization*. AFIT/GAE/ENY/11-D16. Faculty Advisor: Dr. Mark F. Reeder. Sponsor: AFMC.

HATCH, ANGELA B., *Electrospray Propulsion Interface and Mission Modeling for CubeSats*. AFIT/GA/ENY/12-S47. Faculty Advisor: Dr. Jonathan T. Black. Sponsor: JPL.

HOLLENBECK, ALEX C., *Evaluation of the Thorax of Manduca Sexta for Flapping-Wing Micro Air Vehicle Applications*. AFIT/GAE/ENY/12-M22. Faculty Advisor: Dr. Anthony N. Palazotto. Sponsor: AFOSR.

HUBER, DAVID A., *The Use of Various Failure Criteria as Applied to High Speed Wear*. AFIT/GAE/ENY/11-D01. Faculty Advisor: Dr. Anthony N. Palazotto. Sponsor: AFOSR.

HUMPHREY, WILLIAM C., *Validation of the Chemistry Module for the Euler Solver in Unified Flow Solver*. AFIT/GAE/ENY/12-M24. Faculty Advisor: Maj Andrew J. Lofthouse. Sponsor: AFOSR.

HUNT, PETER A., *Electromagnetic Interference Behavior of Multiwall Carbon Nanotubes and Carbon Nanofibers Composites Under Fatigue*. AFIT/GMS/ENY/12-M01. Faculty Advisor: Dr. Shankar Mall. Sponsor: N/A.

JOHNSON, DONALD D., *Cooling Requirements for the Ultra Compact Combustor*. AFIT/GAE/ENY/12-M25. Faculty Advisor: Dr. Marc D. Polanka. Sponsor: AFRL/RZ.

KAUPA, DOUGLAS F., *Structural and Thermal Design Analysis of a Space-Based Chromotomographic Hyperspectral Imaging Experiment*. AFIT/GA/ENY/12-M10. Faculty Advisor: Dr. Jonathan T. Black. Sponsor: N/A.

KLAUSNER, ANDREW J., *Improved Weaponizing Solutions Through Analyzing the Effect of GPS-Jamming on the Accuracy of Precision Guided Munitions*. AFIT/GAE/ENY/12-M26. Faculty Advisor: Lt Col Richard E. Huffman. Sponsor: AMSAA.

LIPSCOMB, MATTHEW R., *Optimization of CubeSat Attitude Control System and Propulsion Subsystems for Orbit Changes*. AFIT/GA/ENY/12-M11. Faculty Advisor: Col Timothy J. Lawrence. Sponsor: AFRL/RZ.

MACDERMOTT, ROBERT B., *An Aerothermal Analysis of a Maneuverable Reentry Body*. AFIT/GAE/ENY/12-M28. Faculty Advisor: Dr. Robert B. Greendyke. Sponsor: NASIC.

MOEN, MICHAEL D., *Methane Dual Expander Aerospike Nozzle Rocket Engine*. AFIT/GA/ENY/12-M12. Faculty Advisor: Lt Col Carl R. Hartsfield. Sponsor: AFRL/RZ.

MURRAY, JEREMY C., *Development of Photographic Dynamic Measurements Applicable to Evaluation of Flapping Wing Micro Air Vehicles*. AFIT/GAE/ENY/11-D02. Faculty Advisor: Dr. Anthony N. Palazotto. Sponsor: AFOSR.

ONO, TOMOYUKI D., *Application of Multi-Input Multi-Output Feedback Control for F-16 Ventral Fin Buffet Alleviation Using Piezoelectric Actuators*. AFIT/GAE/ENY/12-M31. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: TPS.

PADRO, JORGE G., *Development of a Star Tracker-Based Reference System for Accurate Attitude Determination of a Simulated Spacecraft*. AFIT/GAE/ENY/12-M32. Faculty Advisor: Dr. Eric D. Swenson. Sponsor: AFRL/RV. [ANT]

PARKS, ADAM K., *Desensitizing Flame Structure and Exhaust Emissions to Flow Parameters in an Ultra-Compact Combustor*. AFIT/GAE/ENY/12-M33. Faculty Advisor: Dr. Marc D. Polanka. Sponsor: AFRL/RZ.

PLEISCH, JODIE J.E., *TeleTrak Image Processing*. AFIT/GA/ENY/12-M42. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: AFRL/RV.

POPE, MATTHEW T., *Creep Behavior in Interlaminar Shear of a CVI SiC/SiC Composite at Elevated Temperatures in Air and Steam*. AFIT/GMS/ENY/12-M02. Faculty Advisor: Dr. Marina B. Ruggles-Wrenn. Sponsor: AFRL/RX.

SCHREINER, MICHAEL W., *Discrete-Event Simulation of the Low Earth Orbit Satellite Tracking Telescope Network: TeleTrakNet*. AFIT/GSE/ENY/12-M01. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: AFRL/RV.

SHACKELFORD, WILLIAM C., II, *Analysis of the Effects of Target Motion on Delivery Accuracy for the Improvement of Weaponizing Tools*. AFIT/GAE/ENY/12-M35. Faculty Advisor: Dr. Robert B. Greendyke. Sponsor: AMSAA.

SHANK, JASON C., *Development and Testing of a Rotating Detonation Engine Run on Hydrogen and Air*. AFIT/GAE/ENY/12-M36. Faculty Advisor: Dr. Paul I. King. Sponsor: N/A.

SMITH, BRANDON D., *Scaling Study of Wave Rotor Turbo-Normalization of a Small Internal Combustion Engine*. AFIT/GAE/ENY/12-S48. Faculty Advisor: Dr. Marc D. Polanka. Sponsor: AFRL/RZ.

STEFFENS, BENJAMIN R., *Creep of Hi-Nicalon S Ceramic Fiber Tows at Elevated Temperature in Air and in Steam*. AFIT/GMS/ENY/12-M03. Faculty Advisor: Dr. Marina B. Ruggles-Wrenn. Sponsor: AFRL/RX.

SULLIVAN, MICHAEL P., *Characteristics, Causes and Evaluation of Helicopter Particulate Obstruction*. AFIT/GAE/ENY/12-S46. Faculty Advisor: Dr. Donald L. Kunz. Sponsor: N/A.

SUTLIFF, JOSHUA T., *Small Aperture Photometry and Spectroscopy for Satellite Characterization and Identification*. AFIT/GA/ENY/12-M14. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: AFRL/RV.

SZELAG, THEODORE A., *A Finite Element Analysis of a Carbon Fiber Composite Micro Air Vehicle Wing*. AFIT/GAE/ENY/12-M44. Faculty Advisor: Dr. Anthony N. Palazotto. Sponsor: AFOSR.

TEKELL, JOHN P., *Reynolds Number Effects on Thrust Coefficients and PIV for Flapping Wing Micro Air Vehicles*. AFIT/GAE/ENY/12-M38. Faculty Advisor: Dr. Mark F. Reeder. Sponsor: AFRL/RB.

TELLEFSEN, JONATHAN R., *Build Up and Operation of an Axial Turbine Driven by a Rotary Detonation Engine*. AFIT/GAE/ENY/12-M39. Faculty Advisor: Dr. Paul I. King. Sponsor: AFRL/RZ.

URBAN, DANIEL A., *Application of Commercial Software to CubeSat Thermal Analysis*. AFIT/GS/ENY/12-M41. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: N/A.

WILKERSON, BENJAMIN P., *Development of Air Radiation Modeling for Hypersonic Vehicles*. AFIT/GAE/ENY/12-M41. Faculty Advisor: Dr. Robert B. Greendyke. Sponsor: NASIC.

WILLIAMS, DANIEL M., *Empirical Characterization of Unconstrained Tape Spring Deployment Dynamics*. AFIT/GSS/ENY/12-M07. Faculty Advisor: Dr. Jonathan T. Black. Sponsor: N/A.

WOLFE, DANIEL B., *Boundary Layer Measurements in the Trisonic Gas-Dynamics Facility Using Particle Image Velocimetry with CO<sub>2</sub> Seeding*. AFIT/GAE/ENY/12-M43. Faculty Advisor: Dr. Mark F. Reeder. Sponsor: AFRL/RB.

ZAGARIS, CONSTANTINOS, *Trajectory Control and Optimization for Responsive Spacecraft*. AFIT/GA/ENY/12-M13. Faculty Advisor: Dr. Jonathan T. Black. Sponsor: N/A.

### 5.1.3. FACULTY BIOGRAPHIES & RESEARCH OUTPUT

Notes: Research Center affiliations are listed in [ ] if applicable. Shared credit for funding awards is indicated by the percentages shown for each faculty member associated with the project.

#### **AGTE, JEREMY S., Lt Col**

Assistant Professor of Aerospace Engineering, Department of Aeronautics and Astronautics, AFIT  
Appointment Date: 2011 (AFIT/ENY); BS Aeronautical Engineering, United States Air Force Academy, 1997; MS Mechanical Engineering, The George Washington University, 1999; PhD, Aeronautical and Astronautical Engineering, Massachusetts Institute of Technology, 2011. Lt Col Agte has significant experience in aircraft design and flight test engineering as a graduate of the U.S. Air Force Test Pilot School (01A). His research focus areas include aerospace systems design, multidisciplinary design optimization, and multistate design for robustness in long endurance systems. Tel. 255-3636 x4667, email: [Jeremy.Agte@afit.edu](mailto:Jeremy.Agte@afit.edu)

#### REFEREED JOURNAL PUBLICATIONS

Agte, J., Borer, N., de Weck, O., "Multistate Design Approach to Analysis of Twin-engine Aircraft Performance Robustness," *AIAA Journal of Aircraft*, Volume 49, No. 3, May-June 2012.

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

Borer, N., Agte, J., "Design of Robust Aircraft for Persistent Observation Campaigns using Nested Multistate Design," Proceedings of the 12th AIAA ATIO/ISSMO Multidisciplinary Analysis and Optimization Conference, Indianapolis, IN, September 2012, AIAA-2012-5452.

Narek, S., Agte, J., de Weck, O., "Multistate Analysis and Optimization of a Geared Turbofan Engine Lubrication System," Proceedings of the 12th AIAA ATIO/ISSMO Multidisciplinary Analysis and Optimization Conference, September 2012, AIAA-2012-5637.

Borer, N., Agte, J., "A Multistate Design Methodology for Effecting Robust Mission Performance in Long Endurance UAVs," Proceedings of the 50th AIAA Aerospace Sciences Meeting and Exhibit, Nashville, TN, January 2012, AIAA 2012-0844.

#### **AYRES, BRADLEY J.**

Visiting Assistant Professor of Systems Engineering, Department of Aeronautics and Astronautics, AFIT  
Appointment Date: 2012 (AFIT/ENY); BS, Chemical Engineering, University of Missouri, Columbia, 1982; M.A., Procurement and Acquisition Management, Webster University, St. Louis, 1991; M.S., Software Systems Management, Air Force Institute of Technology, 1992; Ph.D., Business Administration specializing in MIS, Florida State University, 2003. Dr. Ayres' research interests include development of complex systems. He is a member of AIAA, the Project Management Institute, and the International Council on Systems Engineering. Tel. 255-3355 x3422 email: [Bradley.Ayres.ctr@afit.edu](mailto:Bradley.Ayres.ctr@afit.edu)

#### **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 is an AIAA Associate Fellow. Tel. 255-3636 x4578, email: [Jonathan.Black@afit.edu](mailto:Jonathan.Black@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

“New Orbital Regimes for Flexible Collection and Reduced Vulnerability.” Sponsor: ORSO. Funding: \$114,000.

“New Deployment Methods for Very Large Antennas.” Sponsor: N/A. Funding: \$75,000 – Black 50%, Cobb 25%, Swenson 25%.

“New Orbital Regimes for Flexible Collection and Reduced Vulnerability.” Sponsor: AS&T. Funding: \$25,000.

“Imaging Chromotomographic Spectrometer Experiment (CTEx).” Sponsor: AS&T. Funding: \$50,000 – Black 34%, Cobb 33%, Swenson 33%.

“Tactical Electronic Support 2 (TES-2) Satellite Design.” Sponsor: ORSO. Funding: \$100,000 – Black 40%, Swenson 30%, Cobb 30%.

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

“Characterizing MAV Wings in Flight.” Sponsor: AFOSR. Funding: \$45,000. [ANT]

“Tactical Electronic Support 2 Spaceflight Experiment.” Sponsor: ORSO. Funding: \$493,000 – Black 50%, Swenson 30%, Cobb 20%.

#### REFEREED JOURNAL PUBLICATIONS

Yates, J.M., Spanbauer, B.W., Black, J.T., “Geostationary Orbit Development and Evaluation for Space Situational Awareness,” *Acta Astronautica*, Vol. 81, Iss. 1, Dec. 2012, pp. 256–272 DOI: 10.1016/j.actaastro.2012.05.011.

Jennings, A., Black, J.T., “Texture-Based Photogrammetry Accuracy on Curved Surfaces,” *AIAA Journal*, Vol. 50, No. 5, May 2012, pp. 1060-1071, DOI: 10.2514/1.J050956.

Firth, J., Black, J.T., “Vibration Interaction in a Multiple Flywheel System,” *Journal of Sound and Vibration*, Vol. 331, Iss. 7, Mar. 2012, pp. 1701–1714, DOI: 10.1016/j.jsv.2011.11.028.

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

Co, T.C., Black, J.T. “Comparison of Electric Propulsion Maneuvers to Conventional Observation Missions,” AIAA Guidance, Control and Dynamics Conference, Minneapolis, MN, Aug. 2012.

Blackstun, M., Swenson, E., Hart, S., Black, J., Cobb, R., “Design, Build, and Test of Engineering Development Spacecraft Hardware in a Satellite Design Course at the Air Force Institute of Technology,” American Society of Engineering Education International Forum 2012, June 2012.

Co, T.C., Zagaris, C., Black, J.T., “Satellite Responsiveness using In- and Out-of-Plane Maneuvering,” Reinventing Space Conference, Los Angeles, CA, May 2012, AIAA-RS-2012-3004.

Doyle, D.D., Black, J.T., “Determination of Feature Generation Methods for PTZ Camera Object Tracking,” Proceedings of SPIE Vol. 8395, Acquisition, Tracking, Pointing, and Laser Systems Technologies XXVI, May 2012, ISBN: 9780819490735. [ANT]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

36th AIAA Dayton-Cincinnati Aerospace Sciences Symposium (DCASS) General Chair, Mar. 2012. [ANT]

53rd AIAA/ASME/ASCE/AHS/ASC Conference on Structures, Structural Dynamics and Materials,  
Structural Dynamics Technical Chair, Apr. 2012.

Space Systems Certificate Program Chair, Department of Aeronautics and Astronautics.

Executive Committee Member of the Ohio Space Grant Consortium representing the Air Force Institute of Technology.

**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](mailto:Richard.Cobb@afit.edu)

SPONSOR FUNDED RESEARCH PROJECTS

“Automatic Ground Collision Avoidance System Trajectory Optimization.” Sponsor: AFRL/RB. Funding: \$12,000. [ANT]

REFEREED JOURNAL PUBLICATIONS

David H. Curtis, Mark F. Reeder, Craig E. Svanberg, Richard G. Cobb, and Gregory H. Parker “Flapping Wing Micro Air Vehicle Bench Test Setup,” IJMAV Volume 4, Number 1, March 2012. [ANT]

Anderson, M. and Cobb, R., “Toward Flapping Wing Control of Micro Air Vehicles,” Journal of Guidance, Control and Dynamics, Feb 2012. [ANT]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Maly, J. R., Yingling A. J., Griffin, S. F., Agrawal B. N., Cobb, R. G., Chambers, T. S., “Vibration Damping for the Segmented Mirror Telescope,” SPIE Astronomical Telescopes and Instrumentation 2012: Advancing Astronomy with Developments on all Scales, Amsterdam, Netherlands, 1-6 July 2012.

Blackstun, M., Swenson, E., Hart, S., Black, J., and Cobb, R. “Design, Build, and Test of Engineering Development Unit CubeSats for Satellite Design Courses,” American Society for Engineering Educator's Inaugural International Forum, San Antonio, Texas, June 9-10, 2012.

Lindholm, G., Ohara, Cobb, R., and Reeder, M., “Power Requirements for Control of Flapping Wing Micro Air Vehicle using Piezoelectric Actuators,” Proceedings of the 50th AIAA Aerospace Sciences Meeting, Orlando, FL, Jan 2012. [ANT]

**DECKER, DOUGLAS D., Lt Col**

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

**GREENDYKE, ROBERT B.,**

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

**SPONSOR FUNDED RESEARCH PROJECTS**

“Modeling and Simulation of Shock Ignition.” Sponsor: AFRL/RW. Funding: \$13,081.

“Investigation of Surface Emission Effects Using ICEPIC.” Sponsor: AFRL/RD. Funding: \$25,000.

“Calculation of Hypersonic Heat Transfer Profiles.” Sponsor: NASIC. Funding: \$15,000.

“Delivery Accuracy Improvements to the JWS Software Package.” Sponsor: AFMC. Funding: \$30,000.

“Use of the Generalized Polynomial Chaos Method in Wargaming Simulations.” Sponsor: USSTRATCOM. Funding: \$32,235.

**SPONSOR FUNDED EDUCATIONAL PROJECTS**

“Aircraft Survivability Training.” Sponsor: USSTRATCOM. Funding: \$9,900 – Greendyke 50%, Hartsfield 25%, Liu 25%.

**REFEREED JOURNAL PUBLICATIONS**

Bentley, B., and Greendyke, R., “New Method of Calculating Adsorption and Scattering for Xe-Pt(111) Using Direct Simulation Monte Carlo Techniques,” *Journal of Vacuum Science and Technology A*, Vol. 30, No. 6, November/December 2012.

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

Martin, C. and Greendyke, R., “Coupled Radiation-Gasdynamic Solution Methodology with a Multispecies-Multitemperature Thermal Model,” AIAA 2012-1147, 50<sup>th</sup> AIAA Aerospace Sciences Meeting, Nashville, TN, January 2012.

Summers, S. and Greendyke, R., “Improved Collision Modeling for Direct Simulation Monte Carlo,” AIAA 2012-0652, 50<sup>th</sup> AIAA Aerospace Sciences Meeting, Nashville, TN, January 2012.

Jelic, R., Scherer, S., Greendyke, R., "Simulation of Various Turret configurations at Subsonic and Transonic Flight Conditions using OVERFLOW," AIAA 2012-0464, 50<sup>th</sup> AIAA Aerospace Sciences Meeting, Nashville, TN, January 2012.

Bentley, B., and Greendyke, R., "New Method of Calculating Adsorption and Scattering for Xe-Pt(111) Using Direct Simulation Monte Carlo Techniques," Directed Energy Professional Society Symposium, Hagerstown, MD, April 2012.

Shackelford, W., and Greendyke, R., "Target Motion and Weaponing," Joint Technical Coordinating Group for Munitions Effectiveness, DAWG Meeting, March 2012.

**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 of AIAA, IEEE, and AUUSI. Tel. 937-255-3636 x7478 (DSN 785-3636, x7478), email: [Frederick.Harmon@afit.edu](mailto:Frederick.Harmon@afit.edu)

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

Assistant Professor of Aeronautical Engineering, Department of Aeronautics and Astronautics, AFIT  
Appointment Date: 2009 (AFIT/ENY); B.S. Aerospace Engineering, Georgia Institute of Technology, 1991; MS, Aeronautical Engineering, Air Force Institute of Technology, 2001; PhD, Astronautical Engineering, Naval Postgraduate School, 2006. Lt Col Hartsfield's primary research areas of interest are rocket propulsion and exhaust plume signature mechanisms. Previous assignments include managing development and integration of adjunct payloads at the National Reconnaissance Office and investigation of mission utility and support requirements for directed energy weapons on tactical aircraft. Tel. 937-255-3636 x7472 (DSN 785-3636 x7472), email: [Carl.Hartsfield@afit.edu](mailto:Carl.Hartsfield@afit.edu)

**SPONSOR FUNDED RESEARCH PROJECTS**

"Space Propulsion Design and Testing." Sponsor: AFRL/RZ. Funding: \$75,000.

"Plasma Actuator Diagnostics Development (PADD)." Sponsor: AFOSR. Funding: \$37,200.

**SPONSOR FUNDED EDUCATIONAL PROJECTS**

"Combat Aircraft Survivability Education." Sponsor: OSD. Funding: \$30,000.

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

Feigenblatt, M.A., Hartsfield, C. R., "Nitric Acid Formation in Af-M315e Decomposition During Ignition Conditions," JANNAF Joint Propulsion Meeting, April 2012.

**OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES**

Invited instructor at 2012 Joint Aircraft Survivability Program Office (JASPO) Aircraft Combat Survivability Short Course in Monterey, CA, May 2012.



**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](mailto:Richard.Huffman@afit.edu)

**KING, PAUL I.,**

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

**SPONSOR FUNDED RESEARCH PROJECTS**

“Optimization of a High-Pressure Turbine Inlet Vane for Increased Performance and Extended Durability.”  
Sponsor: AFRL/RZ. Funding: \$12,000.

**REFEREED JOURNAL PUBLICATIONS**

Rutledge, J.L., King, P.I., Rivir, R., “Influence of Film Cooling Unsteadiness on Turbine Blade Leading Edge Heat Flux,” *ASME Journal of Engineering for Gas Turbines and Power*, Vol. 134, No. 7, July 2012, p. 071901-1 to 10.

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

Johnson, J.J., King, P.I., Clark, J. P. and Ooten, M.K., “Genetic Algorithm Optimization of an HPT Vane Pressure Side Film Cooling Array,” GT-2012-68049, ASME Turbo Expo 2012, Copenhagen, Denmark, June 11-15, 2012.

Johnson, J.J., King, P.I., Clark, J. P. and Koch, P.J., “Exploring Conjugate CFD Heat Transfer Characteristics for a Film-Cooled Flat Plate and 3-D Turbine Inlet Vane,” GT-2012-68065, ASME Turbo Expo 2012, Copenhagen, Denmark, June 11-15, 2012.

Lyall, M.E., King, P.I. and Sondergaard, R., “End Wall Loss and Mixing Analysis of a High Lift Low Pressure Turbine Cascade,” GT-2012-68709, ASME Turbo Expo 2012, Copenhagen, Denmark, June 11-15, 2012.

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

Johnson, J.J., King, P.I., Clark, J.P. and Lethander, A.T., “Validation of Flat Plate Infrared Assessment for Vane Pressure Side Film Cooling Designs,” 47th AIAA/ASME Joint Propulsion Conf., San Diego, CA, 2011.

Johnson, J.J., King, P.I., Clark, J.P., Anthony, R.J., Koch, P.J., Ooten, M.K., Ni, R-H and Humber, W., “Conjugate Heat Transfer Assessment of a 3-D Vane with Film Cooling and Comparison to Experiments,” 47th AIAA/ASME Joint Propulsion Conf., San Diego, CA, 2011.

- Russo, R.M., King, P.I., Schauer, F.R. and Thomas, L.M., "Characterization of Pressure Rise Across a Continuous Detonation Engine," 47th AIAA/ASME Joint Propulsion Conf., San Diego, CA, 2011.
- Rouser, K.P., King, P.I., Schauer, F.R., Hoke, J.L. and Sondergaard, R., "Performance of a Turbine Driven by a Pulsed Detonation Combustor," IMECE2011-64385, Proc. of the ASME Int'l Mech. Engr. Congress & Exposition, Nov. 11-17, 2011, Denver, Colorado, USA.
- Camardo, L.A., King, P.I., Stevens, C., Schauer, F.R. and Hoke, J.L., "Determination of Effective Crossover Location and Dimensions for Branched Detonation in a Pulsed Detonation Engine," 50<sup>th</sup> AIAA Aerospace Sciences Meeting, Orlando, FL, Jan 9-12, 2012.
- Tellefsen, J.R., King, P.I., Schauer, F.R. and Hoke, J.L., "Analysis of an RDE with Convergent Nozzle in Preparation for Turbine Integration," 50<sup>th</sup> AIAA Aerospace Sciences Mtg, Orlando, FL, Jan 9-12, 2012.
- Shank, J.C., King, P.I., Karnesky, J., Schauer, F.R. and Hoke, J.L., "Development and Testing of a Modular Rotating Detonation Engine," 50<sup>th</sup> AIAA Aerospace Sci Mtg, Orlando, FL, Jan 9-12, 2012.
- Stevens, C.A., King, P.I., Schauer, F.R. and Hoke, J.L., "Detonation Reinitiation by Oblique Shock Reflection," 50<sup>th</sup> AIAA Aerospace Sciences Meeting, Orlando, FL, Jan 9-12, 2012.
- Johnson, J.J., King, P.I., Clark, J.P. and Ooten, M.K., "Design Optimization Methods for Improving HPT Vane Pressure Side Cooling Properties Using Genetic Algorithms and Efficient CFD," 50<sup>th</sup> AIAA Aerospace Sciences Meeting, Orlando, FL, Jan 9-12, 2012.

#### **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 100 journal articles, conference papers, and technical reports. Prior to coming to AFIT, Dr. Kunz worked at the US Army Aeroflightdynamics Directorate, McDonnell Douglas Helicopter Company, Old Dominion University, and the US Army Aviation and Missile Command. He is an Associate Fellow of AIAA; a member of AHS and ASME; and a licensed professional engineer in the Commonwealth of Virginia. Tel. 937-255-3636 x4548 (DSN 785-3636 x4548), email: [Donald.Kunz@afit.edu](mailto:Donald.Kunz@afit.edu)

#### **SPONSOR FUNDED RESEARCH PROJECTS**

"CH-47 Rotating System Fault Sensing for Condition Based Maintenance." Sponsor: AMCOM. Funding: \$31,000.

"Structural Dynamics of Membrane Structures Using Hamilton's Weak Principle." Sponsor: AFOSR. Funding: \$33,653.

#### **REFEREED JOURNAL PUBLICATIONS**

Kolsti, K.F. and Kunz, D.L., "A Point Collocation Method for Geometrically Nonlinear Membranes," *International Journal of Solids and Structures*, DOI: 10.1016/j.ijsolstr.2012.08.025, 2012.

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

Kolsti, K.F. and Kunz, D.L., "Dynamic Simulation of Geometrically Nonlinear Membranes Using Hermite Time Interpolation," AIAA/ASME/ASCE/AHS/ASC 53<sup>rd</sup> Structures, Structural Dynamics and Materials Conference, Honolulu, Hawaii, April 2012.

**LIEBST, BRADLEY S.,**

Professor of Aerospace Engineering and Head, Department of Aeronautics and Astronautics, AFIT  
Appointment Date: 1989 (AFIT/ENY); BS, Wichita State University, 1978; MS, Massachusetts Institute of Technology, 1979; PhD, Massachusetts Institute of Technology, 1981. Dr. Liebst's research interests include eigenstructure assignment and control, stability and control of aerospace vehicles, passive and active control of large flexible structures, and aircraft handling qualities. He has published over 30 articles and reports and chaired over 40 theses and dissertations. Prior to teaching at AFIT, Professor Liebst was Assistant Professor of Aerospace Engineering for 6 years at the University of Minnesota where he was voted the 1987 Best Institute of Technology (U of M) Professor. Tel. 937-255-3636 x4636 (DSN 785-6565 x4636), email: [Bradley.Liebst@afit.edu](mailto:Bradley.Liebst@afit.edu)

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

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

**LIU, DAVID, Capt**

Assistant Professor of Aerospace Engineering, Department of Aeronautics and Astronautics, AFIT  
Appointment Date: 2011 (AFIT/ENY); BS Aerospace Engineering, University of Texas at Austin, 2002; MS Aerospace Engineering, University of Texas at Austin, 2004; PhD Astronautical Engineering, Air Force Institute of Technology, 2011. Prior to his assignment to AFIT, Capt Liu was assigned to the AFRL, Space and Missile Directorate at Edwards AFB, CA as lead Experimental Test Engineer and later as Chief of Operations for the Experimental Demonstration Branch. Capt Liu was responsible for testing state-of-the-art rocket Technology for the USAF and other government agencies. Capt Liu was also part of the Joint Combat Assessment Team deployed to Afghanistan to determine the effects of combat damage on Joint aviation assets for the advancement of aircraft sustainability efforts. Capt Liu's interests include experimental research in plasma phenomenon in electric propulsion and other aerospace applications. In addition, Capt Liu's interests include the improvement of aircraft survivability and advances in weapons design. Capt Liu is a member of Tau Beta Pi and Sigma Gamma Tau. Tel. 255-3636 x4542, email: [David.Liu@afit.edu](mailto:David.Liu@afit.edu)

**REFEREED JOURNAL PUBLICATIONS**

Liu, D., Huffman, R. E., Branam, R. D., Hargus, W. A., "Ultrahigh-Speed Imaging of Hall-Thruster Discharge Oscillations with Krypton Propellant," IEEE Transaction on Plasma Science, Vol. 39, No. 11, Nov. 2011.

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

Kenan, D. A., Stults, J. A., Liu, D., Huffman, R. E., Branam, R. D., "Xenon and Krypton Characterization in Satellite Thrusters," 32<sup>nd</sup> International Electric Propulsion Conference, Wiesbaden, Germany, 2011.

Liu, D., Huffman, R. E., Branam, R. D., Hargus, W. A., "200 W Hall Thruster Discharge Oscillations with Xe and Kr Propellant," 42<sup>nd</sup> AIAA Plasmadynamics and Laser Conference, 18<sup>th</sup> International Conference on MHD Energy Conversion, 2011.

**OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES**

Assessor, Joint Combat Assessment Team, Deployed in support of Operation Enduring Freedom XII.

Invited Speaker, "Introduction to Space and Missiles Systems," Missile Technology Control Regime Course, Defense Institute for Security Assistance Management, Redstone Arsenal, AL.

**MALL, SHANKAR,**

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

**SPONSOR FUNDED RESEARCH PROJECTS**

"Characterization and Mitigation of Effects of Corrosion Fatigue on Structural Integrity under Realistic Loading Conditions." Sponsor: OSD. Funding: \$165,000.

"Carbon Nanotubes Based Conductors and Coax Cables for Applications in Space Structures." Sponsor: AS&T. Funding: \$22,365.

"Characterization of Ceramics Matrix Composite in Gas Turbine Engine Environments." Sponsor: AFRL/RX. Funding: \$20,000.

"Characterization of Single Crystal Alloys under Combined Thermomechanical Load and Combustion Environment." Sponsor: AFOSR. Funding: \$36,168.

"Physics-Based Life Prediction Model Incorporating Environmental Effects for SiC/SiC Ceramic Matrix Composites." Sponsor: AFRL/RX. Funding: \$22,500.

"Corrosion Fatigue Crack Formation and Growth Behavior under Biaxial Loading Condition." Sponsor: OSD. Funding: \$180,000.

"Improved Electromagnetic Hardening of Coax Cables and Composites Using Advanced Nanomaterials." Sponsor: DAGSI. Funding: \$17,640.

**MARTIN, CHRISTOPHER L., Capt**

Assistant Professor of Aerospace Engineering, Department of Aeronautics and Astronautics, AFIT Appointment Date: 2012 (AFIT/ENY); BSE: Mechanical, University of Tennessee at Chattanooga, 2005; MS Mechanical Engineering, University of New Mexico, 2008; PhD, Air Force Institute of Technology, 2011. Capt Martin's research interests include all aspects of Computational Fluid Dynamics with a particular interest in modeling thermophysical phenomena, especially those associated with hypersonics, nonequilibrium kinetics and radiation-gasdynamic interactions. Previous research has included the computational modeling of plasma-based aerodynamic actuators and radiation-dominated reentry flow fields. He is a member of Sigma Gamma Tau, Tau Beta Pi and AIAA. Tel. 255-3636 x4403, email: [Christopher.Martin@afit.edu](mailto:Christopher.Martin@afit.edu)

**PALAZOTTO, ANTHONY N.,**

Distinguished Professor of Aerospace Engineering, Department of Aeronautics and Astronautics, AFIT  
Appointment Date: 1975 (AFIT/ENY); BS, New York University, 1955; MS, Brooklyn Polytechnic Institute, 1961; PhD, New York University, 1968. 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 214 archival technical publications and more than 480 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](mailto:Anthony.Palazotto@afit.edu)

**SPONSOR FUNDED RESEARCH PROJECTS**

"Structural Dynamic Characterization of a Biologically Inspired Micro Air Vehicle Wing." Sponsor: AFOSR. Funding: \$39,786.

"Lighter than Air Aircraft-Feasibility Study." Sponsor: Matthew Johnson. Funding: \$12,500.

"Evaluation of Turbine Blades Including Damping." Sponsor: AFRL/RZ. Funding: \$23,000.

"Extreme Wear Resistant Materials." Sponsor: AFOSR. Funding: \$45,000 – Palazotto 90%, Baker 10%.

"Structural Dynamics and Mechanics of Turbomachinery." Sponsor: DAGSI. Funding: \$21,420.

**REFEREED JOURNAL PUBLICATIONS**

Tubbs, T., and Palazotto, A., "Biological Investigation of Wing Motion of the Manduca Sexta," Int. J. of Micro Air Vehicles, Vol. 3, No. 2, pp. 101-112, 2011.

Shepherd, M., Cobb, R., Palazotto, A., and Baker, W., Scaling Analysis of Large Scale Space-Based Membrane Optics," AIAA Journal, Vol. 49, No. 7, pp. 1313-1323, 2011.

Deleon, N., and Palazotto, A., "The Evaluation of a Biologically Inspired Engineered MAV Wing Compared to the Manduca Sexta Wing Under Simulated Flapping Conditions," Int. J. of Micro Air Vehicles, Vol. 3, No. 3, pp. 149-168, 2011.

Palazotto, A., and Meador, S., "Consideration of Wear at High Velocities Using a Hydrocode," AIAA, Journal, Vol. 50, No. 3, pp. 746-751, March 2012.

Demasi, L., Palazotto, A., Hollenbeck, A., and Cavallaro, R., "Exploratory Structural Investigation of a Hawk Moth Inspired MAV's Thorax," AIAA – paper 2012-1379, April 2012.

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

Szelag, T., and Palazotto, A., "Effects of Inaccuracies in Small Nonhomogenous Fiber Specimens," presented at the 7th Annual Dayton Engineering Science Symposium, ASME, Wright State University, Dayton, Ohio, October, 26, 2011.

Hollenbeck, A., and Palazotto, A., "Evaluation of the Hawkmoth Thorax for Flapping Wing Micro Air Vehicles," presented at the 7th Annual Dayton Engineering Science Symposium, ASME, Wright State University, Dayton, Ohio, October, 26, 2011.

- Murray, J., and Palazotto, A., "The Use of Photogrammetry to Evaluate Dynamics Characteristics of a Manduca Sexta Wing," presented at the 7th Annual Dayton Engineering Science Symposium, ASME, Wright State University, Dayton, Ohio, October, 26, 2011.
- Almodovar, G., and Palazotto, A., "Characterization of Composite Materials for Application in Antenna Waveguide Design In Remotely Piloted Aircraft Structures," presented at the 7th Annual Dayton Engineering Science Symposium, ASME, Wright State University, Dayton, Ohio, October, 26, 2011.
- Huber, D., and Palazotto, A., "The Use of Wave Mechanics as Applied to High Speed Wear," presented at the 7th Annual Dayton Engineering Science Symposium, ASME, Wright State University, Dayton, Ohio, October, 26, 2011.
- Palazotto, A., and McCormick, H., "Report on Phase II Progress in High Velocity Wear," January, 8, 2012.
- Buentello, R., Palazotto, A., and Baker, W., "The Evaluation of Material Failure Due to High Speed Sliding," presented at the 37th Annual Dayton-Cincinnati Aerospace Science Symposium, Dayton, Ohio, March, 6, 2012.
- Dauby, B., and Palazotto, A., "The Evaluation of Muscle Reaction of a Manduca Sexta Due to Electronic Impulse," presented at the 37th Annual Dayton-Cincinnati Aerospace Science Symposium, Dayton, Ohio, March, 6, 2012.
- Cox, J., and Palazotto, A., "Mistuning Considerations in a Rotating Disk," presented at the 37th Annual Dayton-Cincinnati Aerospace Science Symposium, Dayton, Ohio, March, 6, 2012.
- Szelag, T., and Palazotto, A., "Composite Material Inaccuracies Considering a Composite MAV Wing," presented at the 37th Annual Dayton-Cincinnati Aerospace Science Symposium, Dayton, Ohio, March, 6, 2012.
- Lee, K., and Palazotto, A., "A Study of the Thermal Environment Developed by a Traveling Sleigh at High Velocities," presented at the 37th Annual Dayton-Cincinnati Aerospace Science Symposium, Dayton, Ohio, March, 6, 2012.
- Almodovar, G., and Palazotto, A., "Characterization of Composite Materials in the X- Band Radio Frequency Range for Application in Antenna and Waveguide Design," presented at the 37th Annual Dayton-Cincinnati Aerospace Science Symposium, Dayton, Ohio, March, 6, 2012.
- Metlen, T., and Palazotto, A., "Design Challenges of Lighter Than Air Vehicles," presented at the 37th Annual Dayton-Cincinnati Aerospace Science Symposium, Dayton, Ohio, March, 6, 2012.
- Hollenbeck, A., and Palazotto, A., "Mechanics of the Hawkmoth Thorax Material Properties and Power Calculations for Micro Air Vehicle Research," presented at the 37th Annual Dayton-Cincinnati Aerospace Science Symposium, Dayton, Ohio, March, 6, 2012.
- DeMarci, L., Palazotto, A., Hollenbeck, A., and Cavallaro, R., "Exploring Structural Investigation of a Hawkmoth Inspired MAV Thorax," AIAA, paper, presented at the AIAA SDM Conference, Honolulu, Hawaii, April, 8, 2012.
- McCormick, H., and Palazotto, A., "Report on the Progress of Phase II High Velocity Wear," presented at Eglin AFB, April, 16, 2012.
- Palazotto, A., and Huber, D., "Evaluation of Wear Under High Velocities," presented at the ASCE Engineering Mechanics Institute Conference, 2012, Notre Dame University, June, 18-20, paper No. 410.

Hollenbeck, A., and Palazotto, A., "Evaluation of the Thorax of a Manduca Sexta for Flapping Wing Micro Air Vehicle Applications," presented at the ASCE Engineering Mechanics Institute Conference, 2012, Notre Dame University, June, 18-20, Paper No. 556.

**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 past Section Chair of the Dayton-Cincinnati Section of the AIAA, and the Honors and Awards Chair for the same section. Dr. Polanka serves as the Faculty representative for the AFIT Student Section branch of AIAA. 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 Turbo Expo conference. Tel. 937-255-3636 x4714 (DSN 785-3636 x4714), email: [Marc.Polanka@afit.edu](mailto:Marc.Polanka@afit.edu)

**SPONSOR FUNDED RESEARCH PROJECTS**

"Fundamental Issues in Integration of a UCC Combustor with a Turbine Vane." Sponsor: AFOSR. Funding: \$41,890 – Polanka 50%, Reeder 25%, Hartsfield 25%.

"Fundamental Understanding of Flowpath Issues through an Engine with an ITB and UCC Combustor." Sponsor: AFOSR. Funding: \$39,258.

"AFIT Combustion Laboratory Program Concerning UCC and Small Engine Combustion Phenomena." Sponsor: AFRL/RZ. Funding: \$36,000.

**REFEREED JOURNAL PUBLICATIONS**

Bohan, B.T., and Polanka, M.D., "Analysis of Flow Migration in an Ultra-Compact Combustor," accepted to the Journal of Engineering for Gas Turbines and Power, 2012.

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

Bohan, B. T., Blunck, D. L., Polanka, M.D., Kostka, S., Jiang, N., Roy, S., Stouffer, S. D., "Impact Of An Upstream Film-Cooling Row On Mitigation Of Secondary Combustion In A High Fuel-Air Environment," GT2012-68310, ASME Turbo Expo 2012, 11-15 June, 2012, Copenhagen, Denmark.

DeLallo, M. R., Polanka, M.D., Blunck, D. L., "Impact of Trench and Ramp Film Cooling Designs to Reduce Heat Release Effects in a Reacting Flow," GT2012-68311, ASME Turbo Expo 2012, 11-15 June, 2012, Copenhagen, Denmark.

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

Smith, B.D., Polanka, M.D., Paxson, D.E., and Hoke, J.L., "Scaling Study of Wave Rotor Turbo Normalization of an Internal Combustion Engine," AIAA-2012-3837, AIAA Joint Propulsion Conference, Atlanta, GA, 30 July - 1 Aug, 2012.

Johnson, D. J., and Polanka, M.D., "Cooling Requirements for an Ultra-Compact Combustor," AIAA-2012-0948, 50th AIAA Aerospace Sciences Meeting, Nashville, TN, 9-12 January, 2012.

Crosbie, S.C., Polanka, M.D., Litke, P., and Hoke, J.L., "Increasing Reliability of a Small 2-Stroke Internal Combustion Engine for Dynamically Changing Altitudes," AIAA-2012-0950, 50th AIAA Aerospace Sciences Meeting, Nashville, TN, 9-12 January, 2012.

Parks, A.K., and Polanka, M.D., "Quantifying Exhaust Emissions and Temperature of the Ultra-Compact Combustor," AIAA-2012-0935, 50th AIAA ASM, Nashville, TN, 9-12 January, 2012.

O'Neil, A., Stouffer, S. D., Kostka, S., Roy, S., Lynch, A., Blunck, D., Gord, J., Polanka, M.D., "Chemiluminescence and High Speed Imaging of Reacting Film Cooling Layers," AIAA-2012-0325, 50th AIAA ASM, Nashville, TN, 9-12 January, 2012.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Chair of the Dayton Cincinnati section of the AIAA.

Honors and Awards Chair for the Dayton Cincinnati section of the AIAA.

Vanguard Chair for the Combustion with Heat Transfer Track for the ASME International Gas Turbine Institute Conference held in Denmark, Copenhagen in 2012.

Chair of the Best Paper Committee for Heat Transfer Committee for the ASME International Gas Turbine Institute evaluating over 35 papers nominated for Best Paper.

#### **RADSICK, TIMOTHY C., Lt Col**

Assistant Professor of Aerospace Engineering, AFIT Appointment Date: 2011 (AFIT/ENY); BS Physics, Harvey Mudd College, 1991; MS Materials, University of California, Santa Barbara, 2001; PhD Materials, University of California, Santa Barbara, 2007. Lt Col Radsick's research interests include: processing of ceramics and ceramic matrix composites; advanced materials and fabrication techniques for aerospace and surface transport vehicles; aircraft life extension and corrosion prevention; and fuel-efficient ground vehicles, specifically hydraulic-pneumatic energy recovery systems and single-person vehicles. In previous assignments he served as Director of the USAF Academy's Center for Aircraft Structural Life Extension (CAStLE) and as Assistant Professor of Engineering Mechanics, was an ESEP Research Scientist at the German Aerospace Center (DLR/Köln-Porz), and researched advanced materials for spacelift at the Rocket Lab at Edwards AFB. In 2011, Lt Col Radsick deployed to Iraq as an Air Advisor and Chief of the New Al-Muthana Base Transition Team. Tel. 255-3636 x4204, email: [Timothy.Radsick@afit.edu](mailto:Timothy.Radsick@afit.edu)

#### **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 four patents to his credit and is a licensed Professional Engineer in the State of Ohio. Dr. Reeder currently serves as the editor-in-chief of the International Journal of Micro Air Vehicles. Dr. Reeder is an Associate Fellow of the AIAA and a member of ASME. Tel. 937-255-3636 x4530 (DSN 785-3636 x4530), email: [Mark.Reeder@afit.edu](mailto:Mark.Reeder@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

"Design and Test of Flapping-Wing Micro Air Vehicles." Sponsor: AFRL/RB. Funding: \$60,000 – Reeder 25%, Cobb 25%, Black 25%, Palazotto 25%. [ANT]



“Acquiring PIV in the Trisonic Gas Facility with Clean Seeding.” Sponsor: AFRL/RB. Funding: \$10,000.

“Flip-Turn Missile Aerodynamic Characterization.” Sponsor: Lockheed Martin. Funding: \$39,800 – Reeder 50%, Lofthouse 50%.

“Continuation of an Experimental Study of Free-Drop Store Separation from a Cavity at Mach 3.” Sponsor: AFRL/RB. Funding: \$10,000.

#### REFEREED JOURNAL PUBLICATIONS

Reynolds, T. and Reeder, M., “The Effect of Discrete Blowing Jets on Submerged Inlet Flow Uniformity,” *International Journal of Flow Control*, Vol. 3, No. 1, pp. 49-66, 2011.

Lynch, A., Batchelor, R., Miller, J., Kiel, B., Gord, J., and Reeder, M. “Spray Characteristics of a Pressure-Swirl Fuel Injector Subjected to a Crossflow and a Coflow,” *Atomization and Sprays*, Vol. 21, No. 8, pp. 625-643, December 2011.

Thomas, L., Branam, R., and Reeder, M., “Flow Measurements Using Particle Image Velocimetry in the Ultra Compact Combustor,” *International Journal of Aerospace Engineering*, Vol. 2012, Article ID 756463, 13 pages, 2012. DOI:10.1155/2012/756463.

Curtis, D., Reeder, M., Svanberg, C., Cobb, R and Parker, G.. “Flapping Wing Micro Air Vehicle Bench Test Setup,” *International Journal of Micro Air Vehicles*, Vol. 4, No. 1, pp. 51-77, March 2012.

Reynolds, T. and Reeder, M., “Effect of Aspect Ratio on Flow through Serpentine Nozzles,” *AIAA Journal of Aircraft*, Vol. 49, No. 3, pp. 836-851, May 2012.

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

Lindholm, G., Cobb, R., Reeder, M., “Power Requirements for Control of Flapping Wing Micro Air Vehicle Using Piezoelectric Actuators,” AIAA-2012-0917, AIAA Aerospace Sciences Meeting, January 2012.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Serving as editor-in-chief for the *International Journal of Micro Air Vehicles*, Multi-Science Publishing.

#### **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 has chaired the ASME PVPD Design & Analysis Technical Committee (2006-2010). She currently serves as the Professional Development Chair of the ASME PVPD 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 American Society of Mechanical Engineers. Tel. 937-255-3636 x4641 (DSN 785-3636 x4641), email: [Marina.Ruggles-Wrenn@afit.edu](mailto:Marina.Ruggles-Wrenn@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

“Biaxial Testing of Ceramic Matrix Composites (CMCs).” Sponsor: AFRL/RX. Funding: \$10,000.

“Mechanical Properties, Creep Deformation and Durability of Ultra High Temperature Ceramics for Aerospace Materials System in Extreme Environments.” Sponsor: AFOSR. Funding: \$55,950.

“Advanced Design and Life Prediction Methodology for Polymeric Matrix Composite Components.”  
Sponsor: AFRL/RX. Funding: \$80,000.

#### REFEREED JOURNAL PUBLICATIONS

C. J. Armani, M. B. Ruggles-Wrenn, G. E. Fair and R. S. Hay, “Creep of Nextel™610 fiber at 1100 °C in air and in steam,” *International Journal of Applied Ceramic Technology*, in press, available on journal website 20 September 2012. DOI: 10.1111/j.1744-7402.2012.02831.x.

M. B. Ruggles-Wrenn and T. P. Jones, “Tension-compression fatigue behavior of a SiC/SiC ceramic matrix composite at 1200 °C in air and in steam,” *International Journal of Fatigue*, in press, available on journal website 30 August 2012. <http://dx.doi.org/10.1016/j.ijfatigue.2012.08.006>.

C. E. C. Ryther and M. B. Ruggles-Wrenn, “the rate (time) – dependent mechanical behavior of the PMR-15 thermoset polymer at temperatures in the 274-316 °C range: experiments and modeling,” *Journal of Pressure Vessel Technology, Transactions ASME*, in press, available on journal website 8 February 2012.

M. B. Ruggles-Wrenn and T. P. Jones, “Tension-compression fatigue of a SiC/SiC ceramic matrix composite at Elevated Temperature,” *Journal of Engineering for Gas Turbines and Power, Transactions ASME*, Vol. 134, No. 9, September 2012, pp. 091301-1 - 091301-6.

M. B. Ruggles-Wrenn, J. Delapasse, A. L. Chamberlain, J. E. Lane, and T. S. Cook, “Fatigue behavior of a Hi-Nicalon™/SiC-B<sub>4</sub>C composite at 1200 °C in air and in steam,” *Materials Science and Engineering A*, Vol. 534, 2012, pp. 119-128.

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

T. P. Jones and M. B. Ruggles-Wrenn, “Tension-compression fatigue of a SiC/SiC ceramic matrix composite at elevated temperature,” GT2012-68902, *Proceedings of ASME Turbo Expo 2012*, Copenhagen, Denmark, June 11-15, 2012.

G. Kurtz and M. B. Ruggles-Wrenn, “Notch sensitivity of fatigue behavior of a Hi-Nicalon/SiC ceramic composite at 1200 °C in air and in steam,” *Proceedings of the 36<sup>th</sup> International Conference & Exposition on Advanced Ceramics & Composites*, Daytona Beach FL, January 22–27, 2012.

T. P. Jones and M. B. Ruggles-Wrenn, “Tension-compression fatigue of a Hi-Nicalon/SiC ceramic matrix composite at 1200 °C in air and in steam,” *Proceedings of the 36<sup>th</sup> International Conference & Exposition on Advanced Ceramics & Composites*, Daytona Beach FL, January 22–27, 2012.

C. E. C. Ryther and M. B. Ruggles-Wrenn, “The Rate (Time) – Dependent Mechanical Behavior of the PMR-15 Thermoset Polymer at Temperatures in the 274-316 °C Range: Experiments and Modeling,” IMECE 2011-63117, *Proceedings of the 2011 ASME International Mechanical Engineering Congress and Exposition*, Denver CO, November 2011.

M. B. Ruggles-Wrenn, “Effects of environment on mechanical behavior of an oxide-oxide ceramic matrix composite at elevated temperature,” *Proceedings of the Materials Science & Technology 2011 Conference and Exhibition*, Columbus OH, October 16-20, 2011.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

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

Communications Chair, 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.

Invited lecture “Effects of environment on mechanical behavior of an oxide-oxide ceramic matrix composite at elevated temperature,” *Materials Science & Technology 2011 Conference and Exhibition*, Columbus OH, October 16-20, 2011.

#### **RUTLEDGE, JAMES L., Capt,**

Assistant Professor of Aerospace Engineering; Department of Aeronautics and Astronautics, AFIT Appointment Date 2011 (AFIT/ENY); BS, Mechanical Engineering, University of Texas at Austin, 2002; MS, Mechanical Engineering, University of Texas at Austin, 2004; PhD, Aeronautical Engineering, Air Force Institute of Technology, 2009. Capt Rutledge’s research interests include experimental and computational work in gas turbine heat transfer, unsteady fluid mechanics and aerothermodynamics. He has authored several refereed journal and conference publications and received the Rohsenow Prize in 2008 from ASME. Capt Rutledge is a member of Tau Beta Pi, AIAA, and ASME. He is a registered professional engineer in the State of Texas and has deployed to Afghanistan in support of Operation Enduring Freedom. Tel. 937-255-3636 x4734 (DSN 785-3636 x4734), email: [James.Rutledge@us.af.mil](mailto:James.Rutledge@us.af.mil)

#### SPONSOR FUNDED RESEARCH PROJECTS

“Unsteady Heat Transfer Characterization for Gas Turbine Engine Film Cooling.” Sponsor: AFOSR. Funding: \$17,379.

#### REFEREED JOURNAL PUBLICATIONS

Rutledge, J.L., King, P.I., Rivir, R., “Influence of Film Cooling Unsteadiness on Turbine Blade Leading Edge Heat Flux,” *Journal of Engineering for Gas Turbines and Power*, Vol. 134, July 2012.

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

Rutledge, J.L. and McCall, J.F., “Determination of Time-Resolved Heat Transfer Coefficient and Adiabatic Effectiveness Waveforms with Unsteady Film Cooling,” ASME Turbo Expo 2012, Paper No. GT2012-68652, 2012.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Rutledge, J.L. and McCall, J.F., “Method for Determining Time-Resolved Heat Transfer Coefficient and Adiabatic Effectiveness Waveforms with Unsteady Film Cooling,” provisional application filed 8 June 2012.

**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  
Simmons' 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, email: [Ronald.Simmons@afit.edu](mailto:Ronald.Simmons@afit.edu)

**SWENSON, ERIC D.,**

Assistant Professor of Aerospace Engineering, AFIT Appointment Date: August 2005 (AFIT/ENY); BS  
Civil Engineering, The Ohio State University, 1993, MS Astronautical Engineering, AFIT; PhD Aerospace  
Engineering, University of Texas at Austin, 2006. 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 x7479 (DSN 785-3636  
x7479), email: [Eric.Swenson@afit.edu](mailto:Eric.Swenson@afit.edu)

**SPONSOR FUNDED RESEARCH PROJECTS**

"Satellite Design, Build and Test." Sponsor: N/A. Funding: \$65,000 – Swenson 34%, Cobb 33%, Black 33%.

"Structural Health Monitoring of Space Structures." Sponsor: AFOSR. Funding: \$25,000 – Swenson 96%,  
Mall 4%.

"Comparison of Traditional and Pseudospectral-Based Optimal Controllers for Spacecraft Attitude Control  
Systems." Sponsor: NPS. Funding: \$25,000.

"AFRL/RV-AFIT 2012 MOA Research." Sponsor: AFRL/RV. Funding: \$250,000 – Swenson 25%, Cobb  
25%, Black 25%, Wiesel 25%.

"Persistent TT&C Using LEO SatComm (PTLS)." Sponsor: AFRL/RV. Funding: \$500,000 – Swenson 40%,  
Cobb 25%, Black 25%, Rutledge 10%.

"AFRL/RV Control Moment Gyroscope Array." Sponsor: AFRL/RV. Funding: \$130,600 – Swenson 40%,  
Cobb 30%, Black 30%.

"Peregrine: Deployable Photon Sieve." Sponsor: DARPA. Funding: \$148,949 – Swenson 40%, Black 25%,  
Cobb 25%, Rutledge 10%.

**REFEREED JOURNAL PUBLICATIONS**

Avalos, J., Swenson, E.D., Mignolet, M.P. E, and Lindsley, N.J. E, "Uncertainty Modeling and Identification  
From GVT Test Data," AIAA Journal of Aircraft, Vol. 49, No. 3, pp. 870-884, 2012.

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

Wright, J., Padro, J., Swenson, E.D., and Leve, F.E, "Hardware Testing of Hybrid Steering Logic for Single-  
Gimbal Control Moment Gyroscopes," Proceedings of AIAA GNC Conference, Minneapolis, MN, 8-11  
Aug. 2012.

- Padro, J., Wright, J., and Swenson, E.D., "Development of a Star Tracker-Based Reference System for Accurate Attitude Determination of a Simulated Spacecraft," Proceedings of AIAA Modeling and Simulation Conference, Minneapolis, MN, 8-11 Aug. 2012.
- Wright, J. and Swenson, E.D., "Comparison of Statically Optimized Proportional-Integral-Derivative and Functionally Optimized Controllers," Proceedings of AIAA GNC Conference, Minneapolis, MN, 8-11 Aug. 2012.
- Swenson, E.D. and Owens, C.T., "Comparisons Analytical and Experimental Measurements of Lamb Wave Interaction with Corrosion Damage in Aluminum Plates," for Proceedings of the 6th European Workshop on Structural Health Monitoring 2012, Dresden, Germany, 3-6 July 2012.
- Ayers, J.E., Owens, C.T., Swenson, E.D., Ghoshal, A.E., Weiss, V.E., "Dynamic Stress Intensity Factors of Canonical Crack Geometries using Piezoelectric Excitation and 3D Laser Vibrometry," Quantitative NonDestructive Evaluation Conference, Denver, CO, 15-20 July, 2012.
- Owens, C.T. and Swenson, E.D., "Comparison of Experimental Measurements and Finite Element Simulations of Lamb Wave Interaction with Fatigue Cracks in Aluminum Plates," for Proceedings of the 6th European Workshop on Structural Health Monitoring 2012, Dresden, Germany, 3-6 July, 2012.
- Blackstun, M., Swenson, E.D., Hart, S.E, Black, J.T.F, and Cobb, R.F, "Design, Build, and Test of Engineering Development Unit CubeSats for Satellite Design Courses," ASEE International Forum, San Antonio, TX, 7-9 June, 2012.
- Swenson, E.D. and Owens, C.T., "Effects of Strain on the Propagation of PZT-induced Lamb Waves in Aluminum Plates Measured via 3D Laser Doppler Vibrometry," Proceedings of 53rd AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials, Honolulu, HI, Apr. 2012.

#### **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](mailto:Peter.Torvik@afit.edu)

#### **REFEREED JOURNAL PUBLICATIONS**

- Torvik, P.J., and J. P. Henderson, "Influence Of Glass Content On Damping Properties Of Plasma-Sprayed Mixtures Of Zirconia And Glass," Journal of Materials Engineering and Performance, Vol. 21, Issue 7, pp. 1405-1415, 2012.

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

- Torvik, P. J., "A Methodology for Evaluating the Damping Properties of Hard Coatings," presented at P-SAR 2012, Propulsion, Safety, Affordability, Reliability Conference, Jacksonville FL, March 21, 2012.

**WIESEL, WILLIAM E., Jr.,**

Professor of Astronautical Engineering, Department of Aeronautics and Astronautics, AFIT Appointment Date: 1977 (AFIT/ENY); BS, University of Massachusetts, 1970; MS, Harvard University, 1972; PhD, Harvard University, 1974. Dr. Wiesel's research interests include applications of dynamical systems theory to orbital mechanics and astrodynamics, especially KAM theory; estimation and control, planetary astronomy, stability theory, and optimal control. Dr. Wiesel is the author of Spaceflight Dynamics, the leading introductory text on astronautical engineering. He has authored over 40 technical papers and has been a member of the department for 35 years. Tel. 937-255-3636 x4312 (DSN 785-3636 x4312), email: [William.Wiesel@afit.edu](mailto:William.Wiesel@afit.edu)

**REFEREED JOURNAL PUBLICATIONS**

William E. Wiesel, "Earth Satellite Perturbation Theories as Approximate KAM Tori,," Journal of the Astronautical Sciences, Vol. 58, No. 2, April-June 2011, pages 153-165 (journal publishing months in arrears).

William E. Wiesel, "Kam Tori Normal Coordinates," Journal of the Astronautical Sciences, Vol. 57, No. 4, Oct-Dec 2009, pages 691-700 (journal publishing years in arrears).

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

Wiesel, W.E., "A Theory of Low Eccentricity Earth Satellite Motion," Proceedings of the 22<sup>nd</sup> AAS/AIAA Space Flight Mechanics Meeting, Jan 29-Feb 2 2012, Charleston S.C., pages 609-627.

## **5.2. DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING**

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### 5.2.1. DOCTORAL DISSERTATIONS

- BRYANT, ADAM R., *Understanding How Reverse Engineers Make Sense of Programs from Assembly Language Representations*. AFIT/DCS/ENG/12-01. Faculty Advisor: Dr. Robert F. Mills. Sponsor: AFRL/RV. [CCR]
- CHRISTIANSEN, BRADLEY D., *Investigation of Gallium Nitride Transistor Reliability through Accelerated Life Testing and Modeling*. AFIT/DEE/ENG/11-04. Faculty Advisor: Dr. Ronald A. Coutu, Jr. Sponsor: AFRL/RV.
- COBB, WILLIAM E., *Exploitation of Unintentional Information Leakage from Integrated Circuits*. AFIT/DEE/ENG/11-06. Faculty Advisor: Dr. Rusty O. Baldwin. Sponsor: NSA. [CCR]
- EILDERS, MARTIN J., *Decentralized Riemannian Particle Filtering with Applications to Multi-Agent Localization*. AFIT/DEE/ENG/12-05. Faculty Advisor: Dr. John F. Raquet. Sponsor: AFRL/RW. [ANT]
- GUTIERREZ DEL ARROYO, JOSE R., *Passive Synthetic Aperture Radar Imaging Using Commercial OFDM Communication Networks*. AFIT/DEE/ENG/12-10. Faculty Advisor: Dr. Julie A. Jackson. Sponsor: AFRL/RV. [ANT]
- KUCIAPINSKI, KEVIN S., *Operational Application of RF Distinct Native Attribute (RF-DNA) Fingerprinting to Commercial SATCOM Devices*. AFIT/DEE/ENG/12-15. Faculty Advisor: Dr. Michael A. Temple. Sponsor: AFRL/RV. [CCR]
- LANGLEY, DERRICK, *Design, Fabrication and Testing of Tunable RF Meta-Atoms*. AFIT/DEE/ENG/12-04. Faculty Advisor: Dr. Ronald A. Coutu. Sponsor: AFRL/RX.
- MANTRAVADI, SAMUEL V., *Resolution Study of a Hyperspectral Sensor Using Computed Tomography in the Process of Noise*. AFIT/DEE/ENG/12-06. Faculty Advisor: Dr. Stephen C. Cain. Sponsor: AFRL/RD.
- REYNOLDS, MICHAEL B., *Resource Provisioning in Large-Scale Self-Organizing Distributed Systems*. AFIT/DCS/ENG/12-03. Faculty Advisor: Dr. Kenneth M. Hopkinson. Sponsor: N/A.
- SHOCKLEY, JEREMIAH A., *Ground Vehicle Navigation Using Magnetic Field Variation*. AFIT/DEE/ENG/12-17. Faculty Advisor: Dr. John F. Raquet. Sponsor: N/A. [ANT]

### 5.2.2. MASTER'S THESES

- ADAMS, THOMAS C., *Empirical Analysis of Optical Attenuator Performance in Quantum Key Distribution Systems Using a Particle Model*. AFIT/GCS/ENG/12-01. Faculty Advisor: Lt Col Jeffrey W. Humphries. Sponsor: LTS. [CCR]
- AVRETT, JOHN T., *Optimum Concentration Ratio Analysis Using Dynamic Thermal Model for Concentrated Photovoltaic System*. AFIT/GE/ENG/12-01. Faculty Advisor: Dr. Stephen C. Cain. Sponsor: N/A.
- BADENHOP, CHRISTOPHER W., *A Black Hole Attack Model for Reactive Ad-Hoc Protocols*. AFIT/GCO/ENG/12-01. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: AFRL/RV. [CCR]
- BALDASSARI, KYLE M., *Considerations for Employment of Defensive Counter Cyberspace Forces for Hunter Operations*. AFIT/ICW/ENG/12-01. Faculty Advisor: Dr. Robert F. Mills. Sponsor: N/A. [CCR]
- BARRON, JOHN W., *RSA Power Analysis Obfuscation: A Dynamic FPGA Architecture*. AFIT/GE/ENG/12-02. Faculty Advisor: Maj Todd R. Andel. Sponsor: AFOSR. [CCR]



BEISLEY, ANDREW P., *Spectral Detection of Human Skin in VIS-SWIR Hyperspectral Imagery Without Radiometric Calibration*. AFIT/GE/ENG/12-03. Faculty Advisor: Lt Col Jeffrey D. Clark. Sponsor: 711 HPW/RH.

BERMAN, DUSTIN, *Emulating Industrial Control System Field Devices Using Gumstix Technology*. AFIT/GCO/ENG/12-13. Faculty Advisor: Maj Jonathan W. Butts. Sponsor: DHS. [CCR]

BETANCES, JOAN A., *Context Aware Routing Management Architecture for Airborne Networks*. AFIT/GCE/ENG/12-01. Faculty Advisor: Dr. Kenneth M. Hopkinson. Sponsor: AFOSR.

BINDEWALD, JASON M., *Detector Design Considerations in High-Dimensional Artificial Immune Systems*. AFIT/GCO/ENG/12-02. Faculty Advisor: Dr. Angela A. Sodemann. Sponsor: 711 HPW/RH.

BRODBECK, ROBERT C., *Covert Android Rootkit Detection: Evaluating Linux Kernel Level Rootkits on the Android Operating System*. AFIT/GCO/ENG/12-14. Faculty Advisor: Dr. Rusty O. Baldwin. Sponsor: N/A. [CCR]

BROWN, BRANDON A., *An FPGA Noise Resistant Digital Temperature Sensor with Auto Calibration*. AFIT/GCE/ENG/12-02. Faculty Advisor: Maj Todd R. Andel. Sponsor: AFOSR. [CCR]

BRUEGGEN, ADAM R., *Trade-offs in a 1 Tbps MIMO Communication System Between an Airship and an Array of Ground Receive Antennas*. AFIT/GE/ENG/12-04. Faculty Advisor: Dr. Richard K. Martin. Sponsor: N/A.

BUSHEY, HENRY W., *Towards Quantifying Programmable Logic Controller Resilience Against Intentional Exploits*. AFIT/GCO/ENG/12-03. Faculty Advisor: Maj Jonathan W. Butts. Sponsor: DHS. [CCR]

BUTLER, MICHAEL S., *Low Cost, Low Complexity Sensor Design for Non-Cooperative Geolocation via Received Signal Strength*. AFIT/GE/ENG/12-05. Faculty Advisor: Dr. Richard K. Martin. Sponsor: AFRL/Ry. [ANT]

CAMPBELL, JONATHON M., *Field Emission of Thermally Grown Carbon Nanostructures on Silicon Carbide*. AFIT/GE/ENG/12-06. Faculty Advisor: Maj Michael C. Pochet. Sponsor: AFRL/RX.

CANCIANI, AARON J., *Integration of Cold Atom Interferometry INS with Other Sensors*. AFIT/GE/ENG/12-07. Faculty Advisor: Dr. John F. Raquet. Sponsor: AFSEO. [ANT]

CARBINO, TIMOTHY J., *Adaptive Routing Algorithm for Priority Flows in a Network*. AFIT/GE/ENG/12-08. Faculty Advisor: Dr. Kenneth M. Hopkinson. Sponsor: AFOSR.

CASSEL, JERMENKO S., *Characterization of Global Positioning Systems (GPS) Coexisting with Wideband and Narrowband Signals*. AFIT/GE/ENG/12-09. Faculty Advisor: Dr. Michael A. Temple. Sponsor: AFRL/Ry. [ANT & CCR]

CICALE, RANDY S., *Cooperative Localization on Computationally Constrained Devices*. AFIT/GCO/ENG/12-04. Faculty Advisor: Maj Jeffrey M. Hemmes. Sponsor: N/A. [ANT & CCR]

COLE, LEE B., *Low Frequency Material Characterization of Thin Substrates in a Coaxial Transmission Line*. AFIT/GE/ENG/12-10. Faculty Advisor: Dr. Michael J. Havrilla. Sponsor: AFRL/Ry.

COMPTON, ANDREW J., *Workload-Based Automated Interface Mode Selection*. AFIT/GCE/ENG/12-03. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: N/A. [CCR]

CORNN, PAUL A., *Spatial Identification of Passive Radio Frequency Identification Tags Using Software Defined Radios*. AFIT/GCE/ENG/12-04. Faculty Advisor: Maj Mark D. Silvius. Sponsor: AFRL/Ry. [ANT]

CRAWFORD, MARTIN H., *Insider Threat Detection on the Windows Operating System Using Virtual Machine Introspection*. AFIT/GCO/ENG/12-15. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: NSA. [CCR]

CURRO, JOSEPH A., II, *Automated Aerial Refueling Position Estimation Using a Scanning LiDAR*. AFIT/GE/ENG/12-11. Faculty Advisor: Dr. John F. Raquet. Sponsor: AFRL/RB. [ANT]

DI TRAPANI, LYALL J., *A Real-Time Strategy Agent Framework and Strategy Classifier for Computer Generated Forces*. AFIT/GCS/ENG/12-04. Faculty Advisor: Dr. Gary B. Lamont. Sponsor: N/A.

ELSNER, DAVID L., *Universal Plug-n-Play Sensor Integration for Advanced Navigation*. AFIT/GE/ENG/12-12. Faculty Advisor: Lt Col Kenneth A. Fisher. Sponsor: N/A. [ANT]

ENG, KWEE G., *Intelligent Behavioral Action Aiding for Improved Autonomous Image Navigation*. AFIT/GE/ENG/12-46. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: AFRL/RY. [ANT & CCR]

ESPOSITO, STEPHEN J., *Analysis of Forensic Super Timelines*. AFIT/ICW/ENG/12-04. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: AFRL/RI.

FARIS, STEPHEN I., *Development of a Radar-Frequency Metamaterial Measurement and Characterization Apparatus*. AFIT/GE/ENG/12-13. Faculty Advisor: Dr. Peter J. Collins. Sponsor: AFRL/RX.

FREEMAN, ANDREW M., *Dismount Threat Recognition Through Automatic Pose Identification*. AFIT/GE/ENG/12-14. Faculty Advisor: Lt Col Jeffrey D. Clark. Sponsor: AFRL/RY.

FRITZKE, AUSTIN W., *Obfuscating Against Side-Channel Power Analysis Using Hiding Techniques for AES*. AFIT/GE/ENG/12-15. Faculty Advisor: Maj Todd R. Anel. Sponsor: AFOSR. [CCR]

GARRIDO, FELIPE E., *OFDM-Based Signal Exploitation Using Quadrature Mirror Filter Bank (QMFB) Processing*. AFIT/GE/ENG/12-16. Faculty Advisor: Dr. Michael A. Temple. Sponsor: Chilean Air Force.

GERICS, SCOTT E., *Intra-Procedural Path-Insensitive Grams (i-grams) and Disassembly Based Features for Packer Tool Classification and Detection*. AFIT/GCE/ENG/12-07. Faculty Advisor: Dr. Rusty O. Baldwin. Sponsor: N/A. [CCR]

GILBERT, JOSEPH I., *Scalable Wavelet-Based Active Network Stepping Stone Detection*. AFIT/GE/ENG/12-17. Faculty Advisor: Lt Col David J. Robinson. Sponsor: N/A. [CCR]

GILLIGAN, MARTIN A., *Magnesium Object Manager Sandbox, A More Effective Sandbox Method for Windows 7*. AFIT/GCE/ENG/12-05. Faculty Advisor: Lt Col Jeffrey W. Humphries. Sponsor: N/A. [CCR]

GIPSON, JONATHON S., *Air-to-Air Missile Enhanced Scoring with Kalman Smoothing*. AFIT/GE/ENG/12-18. Faculty Advisor: Lt Col Kenneth A. Fisher. Sponsor: ACC. [ANT]

GUBLER, TYRONE C., *The White-Hat Bot: A Novel Botnet Defense Strategy*. AFIT/GCS/ENG/12-05. Faculty Advisor: Lt Col Jeffrey M. Hemmes. Sponsor: N/A. [CCR]

HAGEN, JOHN T., *Vulnerability Analysis of the Player Command and Control Protocol*. AFIT/GCO/ENG/12-16. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: AFRL/RY. [CCR]

HAMMOND, GLENN B., II, *Target Classification of Canonical Scatterers Using Classical Estimation and Dictionary Based Techniques*. AFIT/GE/ENG/12-19. Faculty Advisor: Dr. Julie A. Jackson. Sponsor: N/A.

HARDIN, RYAN L., *Magnetic Field Generation and B-Dot Sensor Characterization in the High Frequency Band*. AFIT/GE/ENG/12-20. Faculty Advisor: Lt Col Geoffrey A. Akers. Sponsor: AFRL/RY.

HAY, ANDREW F., *Forensic Memory Analysis for Apple OS X*. AFIT/GCO/ENG/12-17. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: AFRL/RI. [CCR]

HELFEN, JOSHUA D., *Satellite Security: State Analysis Based Command Evaluation*. AFIT/GCO/ENG/12-05. Faculty Advisor: Lt Col Jeffrey W. Humphries. Sponsor: N/A. [CCR]

HERSACK, JONATHAN D., *Utilizing Graphics Processing Units for Network Anomaly Detection*. AFIT/GCO/ENG/12-24. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: N/A. [CCR]

HUFFMAN, MICHAEL A., *The Effects of Cognitive Jamming on Wireless Sensor Networks Used for Geolocation*. AFIT/GE/ENG/12-21. Faculty Advisor: Dr. Richard K. Martin. Sponsor: AFRL/RV. [ANT]

HUMBER, NOEL A., *Design, Modeling, and Measurement of a Metamaterial Electromagnetic Field Concentrator*. AFIT/GE/ENG/12-22. Faculty Advisor: Dr. Peter J. Collins. Sponsor: AFRL/RX.

JOHNSON, JAMES S., *An Analysis of Error Reconciliation Protocols for Use in Quantum Key Distribution*. AFIT/GCE/ENG/12-06. Faculty Advisor: Lt Col Jeffrey W. Humphries. Sponsor: LTS. [CCR]

JURADO, JUAN D., *Enhanced Image-Aided Navigation Algorithm with Automatic Calibration and Affine Distortion Prediction*. AFIT/GE/ENG/12-23. Faculty Advisor: Lt Col Kenneth A. Fisher. Sponsor: DARPA. [ANT]

KASPEREK, ANDREW T., *Enhancing Trust in the Smart Grid by Applying a Modified Exponentially Weighted Averages Algorithm*. AFIT/GCO/ENG/12-18. Faculty Advisor: Dr. Kenneth M. Hopkinson. Sponsor: AFOSR.

KILLION, CHRISTOPHER B., *Augmenting the Global Positioning System with Foreign Navigation Systems and Alternative Sensors*. AFIT/GE/ENG/12-24. Faculty Advisor: Lt Col Michael J. Stepaniak. Sponsor: N/A. [ANT]

KILLPACK, SHAWN O., *Radio Frequency Distinct Native Attribute (RF-DNA) Fingerprinting Applied to Commercial SATCOM Devices*. AFIT/GE/ENG/12-25. Faculty Advisor: Dr. Michael A. Temple. Sponsor: AFRL/RV. [CCR]

KIM, MU J., *Binary Classification of an Unknown Object Through Atmospheric Turbulence Using a Polarimetric Blind-Deconvolution Algorithm Augmented with Adaptive Degree of Linear Polarization Priors*. AFIT/GE/ENG/12-26. Faculty Advisor: Maj Milo W. Hyde. Sponsor: AFRL/RD.

KOZIEL, ERIC A., *Effects of Architecture on Information Leakage of a Hardware Advanced Encryption Standard Implementation*. AFIT/GCO/ENG/12-25. Faculty Advisor: Dr. Rusty O. Baldwin. Sponsor: AFRL/RV. [CCR]

LARKIN, ROBERT D., *Evaluation of Traditional Security Solutions in the SCADA Environment*. AFIT/GCO/ENG/12-06. Faculty Advisor: Maj Jonathan W. Butts. Sponsor: DHS. [CCR]

LOCKE, TIMOTHY P., *Improvements to Optical Communication Capabilities Achieved Through the Optical Injection of Semiconductor Lasers*. AFIT/GE/ENG/12-27. Faculty Advisor: Maj Michael C. Pochet. Sponsor: AFRL/RV.

LUDWIG, MATTHEW T., *UHF Antenna Design for AFIT Random Noise Radar*. AFIT/GE/ENG/12-28. Faculty Advisor: Dr. Peter J. Collins. Sponsor: N/A. [ANT]

MAGAZU, DOMENIC III, *Exploiting the Automatic Dependent Surveillance-Broadcast System via False Target Injection*. AFIT/GCO/ENG/12-07. Faculty Advisor: Dr. Robert F. Mills. Sponsor: N/A. [CCR]

MASTERS, GREGORY P., *Evaluation of Malware Target Recognition Deployed in a Cloud-Based Fileserver Environment*. AFIT/GCO/ENG/12-08. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: N/A. [CCR]

MCMINN, LUCILLE R., *External Verification of SCADA System Embedded Controller Firmware*. AFIT/GCS/ENG/12-02. Faculty Advisor: Maj Jonathan W. Butts. Sponsor: DHS. [CCR]

MERRIT, ERIC J., *Creating Network Attack Priority Lists by Analyzing Email Traffic Using Predefined Profiles*. AFIT/GCO/ENG/12-19. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: N/A. [CCR]

MILLER, CASEY C., *Cyberspace and Real-World Behavioral Relationships: Towards the Application of Internet Search Queries to Identify Individuals At-Risk for Suicide*. AFIT/GCE/ENG/12-08. Faculty Advisor: Maj Jonathan W. Butts. Sponsor: N/A. [CCR]

MILLER, JONATHAN D., *Binary Disassembly Block Coverage by Symbolic Execution vs. Recursive Descent*. AFIT/GCO/ENG/12-09. Faculty Advisor: Dr. Rusty O. Baldwin. Sponsor: N/A. [CCR]

MORABITO, DANIEL B., *Detecting Hardware-Assisted Hypervisor Rootkits within Nested Virtualized Environments*. AFIT/GCO/ENG/12-20. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: AFRL/RI. [CCR]

MORALES, JUAN L., *Computer Aided Multi-Data Fusion Dismount Modeling*. AFIT/GE/ENG/12-29. Faculty Advisor: Lt Col Jeffrey D. Clark. Sponsor: 711 HPW/RH.

MOTES, JERAMY W., *LADAR Range Image Interpolation Exploiting Pulse Width Expansion*. AFIT/GE/ENG/12-30. Faculty Advisor: Dr. Richard K. Martin. Sponsor: AFOSR.

OLIPANE, ROBERT J., *Short Message Service (SMS) Command and Control (C2) Awareness in Android-Based Smartphones Using Kernel-Level Auditing*. AFIT/GCO/ENG/12-21. Faculty Advisor: Dr. Robert F. Mills. Sponsor: N/A. [CCR]

OLIVER, JEREMY S., *Timing Variations in a Magnetic Pulse Compression Circuit*. AFIT/GE/ENG/12-31. Faculty Advisor: Dr. Andrew J. Terzuoli. Sponsor: NASIC.

PACER, BENHUR E., *Process Flow Features as a Host-Based Event Knowledge Representation*. AFIT/GCS/ENG/12-06. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: AFRL/RI. [CCR]

PENN, TIMOTHY R., *All Source Sensor Integration Using an Extended Kalman Filter*. AFIT/GE/ENG/12-32. Faculty Advisor: Dr. John F. Raquet. Sponsor: DARPA. [ANT]

PETERSON, CURTIS J.R., *Near Earth Object Detection Using a Poisson Statistical Model for Detection on Images Modeled from the Panoramic Survey Telescope and Rapid Response System*. AFIT/GE/ENG/12-33. Faculty Advisor: Dr. Stephen C. Cain. Sponsor: AFRL/RD.

PRILESZKY, ISTVAN M., *Cross Hallway Detection and Indoor Localization Using Flash Laser Detection and Ranging*. AFIT/GE/ENG/12-34. Faculty Advisor: Lt Col Michael J. Stepaniak. Sponsor: N/A. [ANT]

RAMSEY, JOHN C., *Electroluminescence Studies on Long Wavelength Indium Arsenide Quantum Dot Microcavities Grown on Gallium Arsenide*. AFIT/GE/ENG/11-46. Faculty Advisor: Dr. Ronald A. Couto, Jr. Sponsor: AFRL/RV.

RAPSON, MATTHEW B.P., *Passive Multistatic Radar Imaging Using an OFDM Based Signal of Opportunity*. AFIT/GE/ENG/12-35. Faculty Advisor: Julie A. Jackson. Sponsor: AFRL/RV. [ANT]

RELYEA, ANDREW L., *Covariance Analysis of Vision Aided Navigation by Bootstrapping*. AFIT/GE/ENG/12-36. Faculty Advisor: Dr. Meir Pachter. Sponsor: AFRL/RW. [ANT]

ROSS, KEITH J., *Application of Game Theory to Improve the Defense of the Smart Grid*. AFIT/GCO/ENG/12-10. Faculty Advisor: Dr. Kenneth M. Hopkinson. Sponsor: AFOSR. [CCR]

ROSS, MATTHEW P., *Multi-Observation Continuous Density Hidden Markov Models for Anomaly Detection in Full Motion Video*. AFIT/GCS/ENG/12-07. Faculty Advisor: Lt Col Brett J. Borghetti. Sponsor: 711 HPW/RH.

SCHNAPP, JAMIE P., *Linear-Quadratic Control of a MEMS Micromirror Using Kalman Filtering*. AFIT/GE/ENG/11-44. Faculty Advisor: Dr. Ronald A. Coutu, Jr. Sponsor: AFRL/RY.

SHIPMAN, CRYSTAL M., *An Application of Con-Resistant Trust to Improve the Reliability of Special Protection Systems within the Smart Grid*. AFIT/GCO/ENG/12-22. Faculty Advisor: Dr. Kenneth M. Hopkinson. Sponsor: AFOSR.

SIEVERS, MATTHEW D., *Data Exfiltration Detection Performance Analysis Using Dedicated Deep Packet Inspection*. AFIT/GCO/ENG/12-11. Faculty Advisor: Dr. Robert F. Mills. Sponsor: N/A. [CCR]

SIMPSON, ANTHONY R., *A Trust Management and Security Framework Enhanced to Secure Satellite Command Links Against Cyber Attacks*. AFIT/GCO/ENG/12-23. Faculty Advisor: Kenneth M. Hopkinson. Sponsor: AFOSR.

SITTERLY, MARCUS A., *Electromagnetic Characterization of Inhomogeneous Media*. AFIT/GE/ENG/12-37. Faculty Advisor: Dr. Michael J. Havrilla. Sponsor: AFRL/RY.

STEELE, MATTHEW F., *Security Verification of Secure MANET Routing Protocols*. AFIT/GCS/ENG/12-03. Faculty Advisor: Maj Todd R. Andel. Sponsor: AFOSR. [CCR]

STEINBOCK, MICHAEL J., *Implementation of Branch-Point-Tolerant Wavefront Reconstructor for Strong Turbulence Compensation*. AFIT/GE/ENG/12-45. Faculty Advisor: Maj Milo W. Hyde. Sponsor: AFOSR.

STOUT, WILLIAM M.S., *Network Performance of Access Control Policies in a Tactical Environment*. AFIT/GCE/ENG/12-09. Faculty Advisor: Dr. Rusty O. Baldwin. Sponsor: AFRL/RY. [CCR]

SWEENEY, NICHOLAS, *Air-to-Air Missile Vector Scoring*. AFIT/GE/ENG/12-38. Faculty Advisor: Lt Col Kenneth A. Fisher. Sponsor: 83 FWS. [ANT]

SZUSTER, MATTHEW L., *A High Bandwidth Non-Destructive Method for Characterizing Simple Media*. Faculty Advisor: Dr. Michael J. Havrilla. Sponsor: AFRL/RY.

THORSON, TIMOTHY J., *Simultaneous Range-Velocity Processing and SNR Analysis of AFIT's Random Noise Radar*. AFIT/GE/ENG/12-40. Faculty Advisor: Lt Col Geoffrey A. Akers. Sponsor: N/A.

VINCENT, OBA L., *Distributed Localization of Active Transmitters in a Wireless Sensor Network*. AFIT/GE/ENG/12-41. Faculty Advisor: Maj Mark D. Silvius. Sponsor: AFRL/RY. [ANT]

WALLIS, KRISTEN L., *An Inquiry: Effectiveness of the Complex Empirical Mode Decomposition Method, the Hilbert-Huang Transform, and the Fast-Fourier Transform for Analysis of Dynamic Objects*. AFIT/GE/ENG/12-42. Faculty Advisor: Dr. Andrew J. Terzuoli. Sponsor: AFRL/RY.

WEISENBERGER, RICHARD P., *Silicon Carbide Capacitive High Temperature MEMS Strain Transducer*. AFIT/GE/ENG/12-43. Faculty Advisor: Dr. Ronald A. Coutu. Sponsor: AFRL/RB.

WILSON, TIMOTHY J., *MFIRE-2: A Multi Agent System for Flow-Based Intrusion Detection Using Stochastic Search*. AFIT/GCO/ENG/12-12. Faculty Advisor: Dr. Gary B. Lamont. Sponsor: N/A.

WOLF, ANDRE, *A Performance Analysis of the Optimized Link State Routing Protocol Using Voice Traffic Over Mobile Ad Hoc Networks*. AFIT/GE/ENG/12-44. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: N/A. [CCR]

### **5.2.3. GRADUATE RESEARCH PAPERS**

BIXBY, ERIC R., *An Analysis of the Computer Security Ramifications of Weakened Asymmetric Cryptographic Algorithms*. AFIT/ICW/ENG/12-02. Faculty Advisor: Dr. Robert F. Mills. Sponsor: N/A. [CCR]

BUTLER, MATT J., *Rapid Delivery of Cyber Capabilities: Evaluation of the Requirement for a Rapid Cyber Acquisition Process*. AFIT/ICW/ENG/12-03. Faculty Advisor: Maj Jonathan W. Butts. Sponsor: N/A. [CCR]

WIMMER, APRIL L., *Evaluating the Effectiveness of Air Force Foundational Cyberspace Training*. AFIT/ICW/ENG/12-05. Faculty Advisor: Maj Jonathan W. Butts. Sponsor: N/A. [CCR]

#### 5.2.4. FACULTY BIOGRAPHIES & RESEARCH OUTPUT

Notes: Research Center affiliations are listed in [ ] if applicable. Shared credit for funding awards is indicated by the percentages shown for each faculty member associated with the project.

##### **AKERS, GEOFFREY A., Lt Col,**

Deputy Department Head and Assistant Professor of Department of Electrical and Computer, 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, noise radar Technology, digital beamforming, and direction finding. Tel. 937-255-3636 x4659 (DSN 785-3636 x4659), email: [Geoffrey.Akers@afit.edu](mailto:Geoffrey.Akers@afit.edu)

##### SPONSOR FUNDED RESEARCH PROJECTS

“RF Modeling.” Sponsor: AFRL/RV. Funding: \$50,000.

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

K. Wallis, G. Akers, P. Collins, R. Davis, A. Frazier, M. Oxley, and A. Terzuoli, “Complex Empirical Mode Decomposition, Hilbert-Huang Transform, and Fourier Transform Applied to Moving Objects,” *IEEE International Geoscience and Remote Sensing Symposium*, 22-27 July 2012.

J. Stringer, G. Lamont, and G. Akers, “Radar Phase-Coded Waveform Design using Multi-Objective Evolutionary Algorithms,” *IEEE Congress on Evolutionary Computation*, pp. 1-8, June 2012.

J. Stringer, G. Akers, and G. Lamont, “Considerations for Adaptive Wideband Digital Beamforming for MUD-WASP,” *Tri-Service Radar Symposium*, June 2012.

T. Thorson and G. Akers, “Near Real-Time Simultaneous Range and Velocity Processing in a Random Noise Radar,” *IEEE Radar Conference*, ISBN 978-1-4673-0658-4, pp. 585-590, May 2012.

J. Stringer, G. Lamont, and G. Akers, “Multi-Objective Evolutionary Algorithm Determined Radar Phase Codes,” *IEEE Radar Conference*, ISBN 978-1-4673-0658-4, pp. 161-166, May 2012.

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

T. Holzheimer, G. Akers, and R. Hardin, “HF Arrays – Via the Impulse Community,” *Antenna Applications Symposium*, 18-20 September 2012.

D. Scarpone, J. Stringer, and G. Akers, “Phased Array Receiver Filtering and Demonstration of Digital Beamforming on Measured Wideband Data,” *National Aerospace & Electronics Conference*, July 2012.

##### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Technical Reviewer: *IEEE Transactions on Aerospace and Electronic Systems*, *IEEE Systems Journal*, and *2012 IEEE Radar Conference Proceedings*.

SIBR technical evaluator for AFRL/RV-Evaluated 12 proposals and selected top ones for funding.

##### **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, network simulation, secure voting protocols, and protocol implementation of field programmable gate arrays.

#### REFEREED JOURNAL PUBLICATIONS

Jeffrey T. McDonald and Todd R. Anel, "Integrating Historical Security Jewels in Information Assurance Education," *IEEE Security and Privacy: Lost Treasures of Computer Security & Privacy*, Vol. 99, No. 1, June 2012, page 5555. [CCR]

Todd R. Anel, Greg Back, and Alec Yasinsac, "Automating the Security Analysis Process of Secure Ad Hoc Routing," *Simulation Modeling Practice and Theory*, Vol. 19, No. 9, October 2011, pp. 2032-2049. [CCR]

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

Brandon A. Brown, Todd R. Anel, and Yong Kim, "An FPGA Noise Resistant Digital Temperature Sensor with Auto Calibration," *In Proceedings of 6<sup>th</sup> International Conference on Information Systems, Technology, and Management (ICISTM 2012)*, Grenoble, France, 28-30 March 2012, pp. 325-335. [CCR]

John Barron, Todd R. Anel, and Yong Kim, "Dynamic Architectural Countermeasure To Protect RSA Against Side Channel Power Analysis Attacks," *In Proceedings of 6<sup>th</sup> International Conference on Information Systems, Technology, and Management (ICISTM 2012)*, Grenoble, France, 28-30 March 2012, pp. 372-383. [CCR]

Matthew F. Steele and Todd R. Anel, "Modeling the Optimized Link-State Routing Protocol for Verification," *Spring Simulation Multi-conference (SpringSim12)*, Orlando, FL, 26-29 March 2012, 8 pages. [CCR]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Reviewer for 7th International Conference on Information Warfare and Security (ICIW 2012) (also on Program Committee).

#### **BALDWIN, RUSTY O.,**

Professor of Computer Engineering, Research 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, embedded and wireless networking, computer security, side channel analysis, and reconfigurable computing systems, and military medical networks. Tel. 937-255-6565 x4445 (DSN 785-6565 x4445), email: [Rusty.Baldwin@afit.edu](mailto:Rusty.Baldwin@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

"Technical Support: Jiseki Development." Sponsor: NSA. Funding: \$300,000 – Baldwin 75%, Raines 25%. [CCR]

"Wireless Communication Study: Project 7622." Sponsor: AFRL/R.Y. Funding: \$5,000. [CCR]

"CRADA between AFIT and EWA Government Systems, Inc: DHS SBIR-2011.2 Phase I." Sponsor: AFRL/RI. Funding: \$30,000 – Baldwin 75%, Raines 25%. [CCR]

"Joint Integrated Electronic Health Record (iEHR) Initial Operating Capability Support." Sponsor: TRICARE. Funding: \$1,790,500. [CCR]

#### SPONSOR FUNDED EDUCATIONAL PROJECTS

"Federal Cyber Service: Scholarship for Service (SFS)." Sponsor: NSF. Funding: \$709,750. [CCR]



#### REFEREED JOURNAL PUBLICATIONS

W. E. Cobb, R. O. Baldwin, and E. D. Laspe, "Leakage Mapping: A Systematic Methodology for Assessing the Side Channel Information Leakage of Cryptographic Implementations," Accepted for publication in Transactions on Information and System Security, September 2012. [CCR]

G. Degirmenci, J. P. Kharoufeh, and R. O. Baldwin, "On the Performance Evaluation of Query-Based Wireless Sensor Networks," Accepted for publication in Performance Evaluation, August 2012. [CCR]

D. P. Montminy, R. O. Baldwin, M. A. Temple, and E. D. Laspe, "Improving Cross-Device Attacks using Zero-Mean Unit-Variance Normalization," Accepted for publication in Journal of Cryptographic Engineering, August 2012. [CCR]

W. E. Cobb, E. D. Laspe, R. O. Baldwin, M. A. Temple, and Y. C. Kim, "Intrinsic Physical Layer Authentication of Integrated Circuits," *Transactions on Information Forensics & Security*, Vol. 7, No. 1, pp. 14-24, February 2012. [CCR]

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

R. O. Baldwin, M. Danis, "Virtualizing the Military's Information Applications," *Interconnected Health 2012*, Rosemont, IL, April 2012. [CCR]

#### **BORGHETTI, BRETT J., Lt Col,**

Assistant Professor of Computer Engineering, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2008; (AFIT/ENG), BSEE, Worcester Polytechnic Institute (WPI), 1992; MSCS, Air Force Institute of Technology, 1996; PhD, Computer Science, University of Minnesota, 2006. His research interests include machine learning, autonomous agents, and multi-agent systems. Tel. 937-255-3636 x4612 (DSN 785-3636 x4612), email: [Brett.Borghetti@afit.edu](mailto:Brett.Borghetti@afit.edu)

#### REFEREED JOURNAL PUBLICATIONS

Weissgerber, K., Lamont, G.B., Borghetti, B.J., and Peterson, G.L., "Determining Solution Space Characteristics for Real Time Strategy Games & Characterizing Winning Strategies," *Computer Games Technology Journal*, Vol. 2011, 2011, pp. 1-17. DOI:10.1155/2011/834026. [ANT]

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

Sodemann, A.A., Ross, M.P., and Borghetti, B.J., "A Review of Anomaly Detection in Automated Surveillance," *IEEE Transactions on System, Man, and Cybernetics Part C*. (Accepted for publication June, 2012, Manuscript No. SMCC-11-05-0211).

#### **BUTTS, JONATHAN W., Maj,**

Division Chief and Assistant Professor of Computer Science, 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, telecommunication systems security, strategic communications and operationalizing military actions in cyberspace. Tel. 937-255-3636 x4332 (DSN 785-3636x4332), email: [Jonathan.Butts@afit.edu](mailto:Jonathan.Butts@afit.edu)

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Chair, IFIP Working Group 11.10 on Critical Infrastructure Protection.

Co-chair, Sixth Annual International Conference on Critical Infrastructure Protection.

Committee member, 2012 International Symposium on Resilient Control Systems.

Research subcommittee Chair, Coalition for Advancing Cybersecurity Education.

Advisor, Cyber Security Education Consortium.

Committee member, Roadmap and Vendor Working Groups, DHS ICS Joint Working Group.

Member, AF CyberVision 2025 Working Group.

Academic curriculum co-chair, AFIT Cyber Warfare Degree Program.

Refereed nine journal articles and twelve conference articles.

**CAIN, STEPHEN C.,**

Associate Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT  
Appointment Date: 2003 (AFIT/ENG), BSEE, University of Notre Dame, 1992; MSEE, Michigan  
Technological University, 1994; PhD, University of Dayton, 2001. His research interests include electro-  
optics, remote sensing, and signal processing. Tel. 937-255-3636 x4625 (DSN 785-3636 x4625), email:  
[Stephen.Cain@afit.edu](mailto:Stephen.Cain@afit.edu)

**SPONSOR FUNDED RESEARCH PROJECTS**

“Multi-Frame Fusion of 2-D and 3-D FLASH LADAR for Simultaneously Improving Both Spatial and  
Range Resolution.” Sponsor: AFOSR. Funding: \$33,790 – Cain 50%, Martin 50%.

“Signal Processing for Improving SST Detection Performance.” Sponsor: DARPA. Funding: \$105,000.

“RADAR/LADAR Dual Class Discrimination Experiment Risk Reduction.” Sponsor: AFRL/RY. Funding:  
\$30,000.

**REFEREED JOURNAL PUBLICATIONS**

Brian Neff and Stephen Cain, “Multiple Surface Discrimination in 3-D FLASH Laser Radar While  
Minimizing the Effects of Diffraction,” *Optical Engineering*, Vol. 51, No. 5, 056201 pp 1-16, May 2012.

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

John Avrett, Stephen Cain and Michael Pochet, “Dynamic Thermal Analysis of a Concentrated Photo-Voltaic  
System,” SPIE Proceedings Vol. 8256, San Francisco, CA, January 2012.

**CLARK, JEFFREY D., Lt Col,**

Assistant Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT  
Appointment Date: 2011 (AFIT/ENG), BS, Electrical Engineering, University of Arkansas, 1994; MS,  
Electrical Engineering, Air Force Institute of Technology, 2006; PhD, Electrical Engineering, Air Force  
Institute of Technology, 2011. His research interests include artificial intelligence, machine learning,  
hyperspectral remote sensing. Tel. 937-255-3636 x4614 (DSN 785-3636 x4614), email:  
[Jeffrey.Clark@afit.edu](mailto:Jeffrey.Clark@afit.edu)

**SPONSOR FUNDED RESEARCH PROJECTS**

“Dismount Modeling and Detection.” Sponsor: 711 HPW/RH. Funding: \$770,126.

“Dismount Detection and Characterization through Sensor Fusion.” Sponsor: AFRL/RY. Funding: \$86,000.

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

34<sup>th</sup> Review of the Atmospheric Transmission models Meeting, Albuquerque, New Mexico, 12-14 June 2012, "Estimating Scene Illumination with Modtran for Real-time Hyperspectral Target Detection in Unknown Conditions," Andrew P. Beisley, Jeffrey D. Clark, Michael A. Marciniak, Michael J. Mendenhall.

#### **COLLINS, PETER J.,**

Associate Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT  
Appointment Date: 2006 (AFIT/ENG); BA, Bethel College, MN, 1985; BSEE, University of Minnesota, 1985; MSEE, Air Force Institute of Technology, 1990; PhD, Air Force Institute of Technology, 1996. His research interests include low observables, computational electromagnetics, radar cross section metrology, remote sensing, and electromagnetic material design and analysis. He is a senior member of the IEEE. Tel. 937-255-3636 x7256 (DSN 785-3636 x7256), email: [Peter.Collins@afit.edu](mailto:Peter.Collins@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

"Enabling Technologies for Radar Scattering Measurements." Sponsor: AFMC. Funding: \$110,360.

"Fast Doppler Reference Solutions." Sponsor: AFRL/RY. Funding: \$21,421.

"Technical Support: RCS Metrology." Sponsor: 46 TG. Funding: \$11,000.

#### REFEREED JOURNAL PUBLICATIONS

Langley, D., Coutu, Jr., R. A., and Collins, P. J., "Low-loss Meta-atom for Improved Resonance Response," AIP Advances, DOI 10.1063/1.3701709, Vol. 2, No. 1, pp. 1366-1371, February 2012.

Coutu, Jr., R. A., Collins, P. J., Moore, E. A., Langley, D., Jussaume, M. E., and Starman, L. A.  
"Electrostatically Tunable Meta-atoms Integrated with In-situ Fabricated MEMS Cantilever Beam Arrays," IEEE/ASME Journal of Microelectromechanical Systems, DOI 10.1109/JMEMS.2011.2167659, Vol. 20, No. 6, pp. 1366-1371, October 2011.

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

Collins, P. J., Priestly, J. A., "Trading Spectral Efficiency for System Latency in True-Random Noise Radar Network Through Template-Replay Diversity," IEEE 2012 Waveform Diversity and Design Conference, 22-27 January 2012, Kauai, HI.

Kristen Wallis, Geoffrey Akers, Peter Collins, Richard Davis, Alan Frazier, Andrew Terzuoli, "Complex Empirical Mode Decomposition, Hilbert-Huang Transform, and Fourier Transform Applied to Moving Objects," IEEE 2012 International Geoscience and Remote Sensing Symposium, 22-27 July 2012, Munich, Germany.

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

Glauvitz, N.E., Coutu, Jr., R.A., Collins, P.J. and Starman, L.A., "Etching Silicon Dioxide for CNT Field Emission Device," *The 13th International Symposium on MEMS and Nanotechnology, SEM Annual Conference*, pp.1-7, CA, 11-14 June 2012.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

AFIT Civilian of the Year, Category III, 2011.

AETC's 2012 Nominee for the AF Jon S. Ogg Innovation Category.

Nominated to a position on the Antenna Measurement Techniques Association's Board of Directors.

Executive Committee Member of the National Radar Cross Section (RCS) Measurement Facilities Certification Program.

**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 micro electric contacts, phase change materials, tunable metamaterials and terahertz components. 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 the IEEE. Tel. 937-255-3636 x7230 (DSN 785-3636 x7230), email: [Ronald.Coutu@afit.edu](mailto:Ronald.Coutu@afit.edu)

**SPONSOR FUNDED RESEARCH PROJECTS**

“Cleanroom Orientation/Usage.” Sponsor: 711 HPW/RH. Funding: \$15,000.

“Photoacoustic Detection of Terahertz Radiation for Chemical Sensing and Imaging Applications.” Sponsor: AFOSR. Funding: \$41,958.

“Device Fabrication and Test Support.” Sponsor: AFRL/RV. Funding: \$49,839.

**REFEREED JOURNAL PUBLICATIONS**

Moore, E.A., Langley, D., Jussaume, M.E., Rederus, L.A., Lundell, C.A., Coutu, Jr., R.A., Collins, P.J. and Starman, L.A., “SRRs Embedded with MEMS Cantilevers to Enable Electrostatic Tuning of the Resonant Frequency,” *Journal of Experimental Mechanics*, Springer, Digital Object Identifier (DOI) 10.1007/s11340-011-9498-8, Vol. 52, Issue 4, pp 395-403, 2012 (2011 Impact factor – 1.854).

Ostrow, S.A., Lake, R.A., Lombardi, J.P., Coutu, Jr., R.A. and Starman, L.A., “Fabrication Process Comparison and Dynamics Evaluation of Electrothermal Actuators for a Prototype MEMS Safe and Arming Device,” *Journal of Experimental Mechanics*, Digital Object Identifier (DOI) 10.1007/s11340-011-9579-8, pp. 1- 10, 2012.

Starman, L.A. and Coutu, Jr., R.A., “Stress Monitoring of Post-Processed MEMS Silicon Microbridge Structures Using Raman Spectroscopy,” *Journal of Experimental Mechanics*, Digital Object Identifier (DOI) 10.1007/s11340-011-9586-9, pp. 1-13, 2012.

Langley, D., Coutu, Jr., R.A. and Collins, P.J., “Low-loss Meta-Atom for Improved Resonance Response,” *American Institute of Physics (AIP) Advances*, Digital Object Identifier (DOI) 10.1063/1.3701709, pp. 1-5, 2012.

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

Glauvitz, N.E., Blazevec, S., Coutu, Jr., R.A., Medndev, I. and Petkie, D., “A MEMS Photoacoustic Detector of Terahertz Radiation for Chemical Sensing,” *Proceeding of Eurosensors XXVI*, Poland, Sept 2012.

Danner, B.L. and Coutu, Jr., R.A., “Characterizing Metal-Insulator-Transition (MIT) Phase Change Materials (PCM) for RF and DC Micro-switching Elements,” *Proceeding of Eurosensors XXVI*, Poland, Sept 2012.

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

Glauvitz, N.E., Coutu, Jr., R.A., Collins, P.J. and Starman, L.A., "Etching Silicon Dioxide for CNT Field Emission Device," *The 13th International Symposium on MEMS and Nanotechnology, SEM Annual Conference*, pp.1-7, CA, 11-14 June 2012.

Weisenberger, R.P., Coutu, Jr., R.A. and Starman, L.A., "Silicon Carbide High Temperature MEMS Capacitive Strain Sensor," *The 13th International Symposium on MEMS and Nanotechnology, SEM Annual Conference*, pp.1-10, CA, 11-14 June 2012.

Danner, B.L. and Coutu, Jr., R.A., "Characterizing Metal Insulator Transition (MIT) materials for use as micro-switch elements," *The 13th International Symposium on MEMS and Nanotechnology, SEM Annual Conference*, pp.1-8, CA, 11-14 June 2012.

Toler, B.F. and Coutu, Jr., R.A., "Characterizing External Resistive, Inductive and Capacitive Loads for Micro-Switches," *The 13th International Symposium on MEMS and Nanotechnology, SEM Annual Conference*, pp.1-8, CA, 11-14 June 2012.

Jones, H.R., Ganti, S., Deibel, J.A. and Coutu, Jr., R.A., "Characterization of Metamaterial Devices Using Terahertz Time-Domain Spectroscopy," *presented at 7th Annual Dayton Engineering Science Symposium*, Dayton, OH, Nov 2011. (Presentation only)

Coutu, Jr., R.A. and Starman, L.A., "Surface Micromachined Contact Support Structure for Microswitch Lifecycle Testing," *The 13th International Symposium on MEMS and Nanotechnology, SEM Annual Conference*, CA, 11-14 June 2012. (Presentation only)

#### **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](mailto:Nathaniel.Davis@afit.edu)

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Computer Engineering program evaluator on the ABET accreditation evaluation team for the engineering programs at the State University of New York, Binghamton, 30 Sep – 2 Oct 12.

#### **DUBE, THOMAS E., Maj,**

Assistant Professor of Computer Engineering, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2011 (AFIT/ENG); BCE, Computer Engineering, Auburn University, 2000; MS, Information Assurance, Air Force Institute of Technology, 2006; PhD, Computer Engineering, Air Force Institute of Technology, 2011. His research interests include cyberspace operations, malware analysis, reverse engineering software engineering, and machine learning. Maj Dube is a member of the IEEE and a member of Eta Kappa Nu and Tau Beta Pi honorary societies. Tel. 937-255-3636 x4613 (DSN 785-3636x4613), email: [Thomas.Dube@afit.edu](mailto:Thomas.Dube@afit.edu)

#### REFEREED JOURNAL PUBLICATIONS

Dube, T., R. Raines, G. Peterson, K. Bauer, M. Grimaila and S. Rogers, "Malware Target Recognition via Static Heuristics," *Computers and Security*, Vol. 31, Issue 1, February 2012, pp. 137-147. [CCR]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

T. Dube, R. Raines, and S. Rogers, "Patent Application for Malware Target Recognition," Apr. 1, 2012. [CCR]

#### **FISHER, KENNETH A., Lt Col,**

Deputy Director, Advanced Navigation Technology (ANT) Center; 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](mailto:Kenneth.Fisher@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

"Hybrid Sensor Fusion for Autonomous Applications." Sponsor: AFOSR. Funding: \$30,929 – Fisher 75%, Pachter 25%. [ANT]

"Increased Understanding of Vision-Aided Navigation Uncertainty Estimates." Sponsor: AFRL/RV. Funding: \$14,549 – Fisher 80%, Raquet 20%. [ANT]

#### REFEREED JOURNAL PUBLICATIONS

Fisher, K. A. and J. F. Raquet, "Non-GPS Precision Position, Navigation, and Timing," *Air and Space Power Journal, Chinese*, Vol. 5, No. 3, pp. 45-53, Fall 2011. [ANT]

Fisher, K. A. and J. F. Raquet, "Non-GPS Precision Position, Navigation, and Timing," *Air and Space Power Journal, Spanish*, Fourth Quarter, pp. 87-96, Fall 2011. [ANT]

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

Fisher, K., J. Raquet, and J. Kresge, "Affine Feature Matching via Stochastic Prediction," Proceedings of 25<sup>th</sup> International Technical Meeting of The Satellite Division of the Institute of Navigation (ION GNSS 2012), Nashville, TN, 2012. [ANT]

Jurado, J. and K. Fisher, "Automatic Camera Calibration," *7th Annual Dayton Engineering Sciences Symposium (DESS 2011)*, Dayton, OH, Oct 2011. [ANT]

Foley, B., A. Wood, and K. Fisher, "Dempster Shafer Estimation Techniques for Navigation," *37th Dayton-Cincinnati Aerospace Sciences Symposium (DCASS)*, Mar 2012. [ANT]

Sweeney, N. and K. Fisher, "Air-to-Air Missile Tracking using COTS Sensors," *2012 Joint Navigation Conference (JNC)*, Colorado Springs, Colorado, June 2012. [ANT]

Foley, B., A. Wood, and K. Fisher, "A Dempster-Shafer Method for Multi-Sensor Fusion," *2012 Joint Navigation Conference (JNC)*, Colorado Springs, Colorado, June 2012. [ANT]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Served as Subject Matter Expert to DARPA on All Source Positioning and Navigation Program. [ANT]

Served as Signals of Opportunity Navigation Subject Matter Expert for Dr. Jon Sjogren, AFOSR. [ANT]

Session Chair for DESS 2011 (Oct 2011). [ANT]

Session Chair for ION GNSS 2011 (Oct 2011). [ANT]

Session Chair for ION JNC 2012 (June 2012). [ANT]

AFOSR proposal reviewer for Dr. Jon Sjogren (area: signals of opportunity navigation). [ANT]

**GOODMAN, SCOTT A., Maj,**

Instructor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2009 (AFIT/ENG); BSEE, University of Kansas, 1997; MSEE, Air Force Institute of Technology, 2001. Currently pursuing a PhD with The Ohio State University. His research interests include antenna theory, radar cross section theory, antenna and radar cross section measurement methodologies and electromagnetic theory. Tel. 937-255-3636 x4683 (DSN 785-3636 x4683), email: [Scott.Goodman@afit.edu](mailto:Scott.Goodman@afit.edu)

**HAKER, MARSHALL E., Maj,**

Instructor, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2012 (AFIT/ENG); BS, Electrical and Computer Engineering, The Ohio State University, 2002; MS Electrical Engineering, 2007. His research interests include the protection of global radionavigation signals, the development of robust error reduction designs for global radionavigation receivers, and navigation warfare. Tel 937-255-3636 x4603 (DSN 785-3636 x4603), email: [Marshall.Haker@afit.edu](mailto:Marshall.Haker@afit.edu)

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

M. Haker, J. Raquet, "Applying Detection Theory to Define Stopping Criteria for the Signal Decomposition and Parameterization Algorithm," International Conference on Localization and GNSS 2012, Stanberg, Germany, Jun 2012. [ANT]

M. Haker and J. Raquet, "Estimating Multipath in GNSS Signals Through a Novel Stochastic Search and Decomposition Algorithm," Proceedings of 24<sup>th</sup> International Technical Meeting of The Satellite Division of the Institute of Navigation (ION GNSS 2011), Portland, OR, 2011, pp. 1162-1172. [ANT]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

M. Haker and J. Raquet, "Tracking Multipath in Received GNSS Signals through use of a Signal Decomposition and Parameterization Algorithm," Proceedings of 25<sup>th</sup> International Technical Meeting of The Satellite Division of the Institute of Navigation (ION GNSS 2012), Nashville, TN, 2012. [ANT]

**HAVRILLA, MICHAEL J.,**

Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2002 (AFIT/ENG); BS, Michigan State University, 1987, MSEE, Michigan State University, 1989, PhD, Michigan State University, 2001. His research interests include electromagnetic theory, guided wave theory and applications, electromagnetics of complex media, material characterization, low observables, electromagnetic scattering and antenna theory. He is a member of HKN and Sigma Xi, 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](mailto:Michael.Havrilla@afit.edu)

SPONSOR FUNDED RESEARCH PROJECTS

"Material Measurement Laboratory Research." Sponsor: AFRL/RV. Funding: \$190,841.

"Material Characterization of Complex Media." Sponsor: AFRL/RV. Funding: \$55,000.

REFEREED JOURNAL PUBLICATIONS

M. Seal, M. Hyde and M. Havrilla, "Nondestructive complex permittivity and permeability extraction using a two-layer dual-waveguide probe measurement geometry," Progress in Electromagnetic Research, Vol. 123, pp. 123-142, 2012.

G. Dester, E. Rothwell and M. Havrilla, "A two-iris method for the electromagnetic characterization of conductorbacked absorbing materials using an open-ended waveguide probe," IEEE Transactions on Instrumentation and Measurement, Vol. 61, No. 4, pp. 1037-1044, April 2012.

M. Hyde, M. Havrilla, A. Bogle and E. Rothwell, "Nondestructive material characterization of a free-space-backed magnetic material using a dual-waveguide probe," IEEE Transactions on Antennas and Propagation, Vol. 60, No. 2, pp.1009-1019, February 2012.

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

M. Hyde and M. Havrilla, "Design of an open-ended coaxial probe for broadband, low-footprint Nondestructive characterization of PEC-backed materials," IEEE International Instrumentation and Measurement Technology Conference (I2MTC) Proceedings, pp. 1599-1602, Graz, Austria, May 2012.

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

B. Crowgey, O. Tuncer, E. Rothwell, B. Shanker, L. Kempel, and M. Havrilla, "Characterization of gyromagnetic material using a reduced aperture waveguide," URSI National Radio Science Meeting Abstracts, pg. TBD, Chicago, IL, July 2012.

M. Havrilla and M. Hyde, "Complex media, symmetry and material properties," Material Measurement Working Group Conference Abstracts, pg. 1, Rapid City, SD, October 2011.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Invited and presented a paper at the International Union of Radio Science General Assembly Symposium in Istanbul, Turkey, 2011. This is an extremely prestigious conference in electromagnetic theory and only occurs once every three years.

#### **HODSON, DOUGLAS D.,**

Assistant Professor of Software Engineering, Department of Electrical and Computer Engineering, AFIT  
Appointment Date: 2011 (AFIT/ENG); BS, Physics, Wright State University, 1985; MS, Electro-Optics, University of Dayton, 1987; MBA, University of Dayton, 1999; PhD, Computer Engineering, AFIT, 2009.  
His research interests include real-time distributed simulation architectures for training, test and analysis, networks, design patterns for modeling radar and infrared effects. His research interest also includes the modeling and simulation of Quantum Key Distribution protocols. Tel. 937-255-3636 x4719, email: [Douglas.Hodson@afit.edu](mailto:Douglas.Hodson@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

"Software Architecture, Human Behavioral Modeling and Experimental Design Research." Sponsor: ASC.  
Funding: \$100,000. [ANT]

#### REFEREED JOURNAL PUBLICATIONS

M.R. Grimaila, J. Morris, D. Hodson, "Quantum Key Distribution: A Revolutionary Security Technology," The Information System Security Association (ISSA) Journal, pp. 20-27, Jun 2012. [CCR]

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

D.D. Hodson, R. Hill and A. Gutman, "Using LVC Simulations for Systems Analysis – Experimental and Software Design Issues," 80<sup>th</sup> Military Operations Research Society Symposium (MORS), Jun 2012. [CCR]



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

D.D. Hodson, “Architecting Multi-Station Simulators,” Spring Simulation Developer’s Working Group (SDAWG sponsored by AFRL), Apr 2012. [CCR]

D.D. Hodson, R. Hill and A. Gutman, “Using LVC Simulations for Systems Analysis – Experimental and Software Design Issues,” Defense Analysis Seminar XVI – Analysis Support to Sustain and Enhance the ROK-US Alliance (DAS-XVI), Apr 2012. [CCR]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Hodson, D., Gehl, D., “Real-Time Data Recorder Framework and Software Implementation,” Real-Time software implementation being used to save simulation state data in a variety of formats (text-based, binary, etc) to support ASC/XRA Simulation virtual and constructive studies – for example Anti-Access / Aerial Denial (A2AD) data-link studies, 14 June 2012.

Hodson, D., Peterson, G., “Unified Behavior Framework (UBF) and Software Implementation,” UBF software implementation being used to create simulated intelligent agents to support ASC/XRA Simulation and Analysis Facility studies, 20 April 2012.

Associate editor for Journal of Defense Modeling and Simulation: Applications, Methodology, Technology (JDMS). Also, editor for special issue titled “The Art and Science of Using Live-Virtual-Constructive Simulations for Analysis and Test.”

Defense Analysis Seminar XVI – Analysis Support to Sustain and Enhance the ROK-US Alliance (23-25 April 2012), Hodson, D., Hill, R., Gutman, A., “Using LVC Simulations for Systems Analysis – Experimental and Software Design Issues,” accepted on the basis of peer review.

80<sup>th</sup> Military Operations Research Society Symposium (11-14 Jun 2012), Hodson, D., Hill, R., Gutman, A., “Using LVC Simulations for Systems Analysis – Experimental and Software Design Issues,” accepted on the basis of peer review.

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

Associate Professor, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2004 (AFIT/ENG), BSCS, Rensselaer Polytechnic Institute, 1997, MSCS, Cornell University, 2002, Ph.D. Cornell University, 2004. His research interests include wired and wireless networking, fault tolerant and reliable distributed systems, middleware, operating systems, net-centric warfare, network security, cloud computing, and the use of networks to enhance critical use of infrastructures. Dr. Hopkinson is a senior member of the IEEE a senior member of the ACM, and a member of the Upsilon Pi Epsilon and Eta Kappa Nu honorary societies. Tel. 937-255-3636 x4579 (DSN 785-3636 x4579), email: [Kenneth.Hopkinson@afit.edu](mailto:Kenneth.Hopkinson@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

“Cognitive Augmentation for Network Operations.” Sponsor: AFRL/RI. Funding: \$40,000 – Hopkinson 60%, Laviers 40%.

“Context Aware Routing and Management Architecture (CARMA) for Airborne Networks.” Sponsor: AFRL/RV. Funding: \$15,000.

“Technical Support: Cognitive and Mobile Networks.” Sponsor: AFRL/RI. Funding: \$90,000. [ANT]

“Using Cognitive Radios to Enhance Communication Capabilities.” Sponsor: AS&T. Funding: \$50,000 – Hopkinson 51%, Silvius 49%.

“A Context-Aware Approach for Enabling Large-Scale Mobile Networks.” Sponsor: AFOSR. Funding: \$43,040. [ANT]

“HPC Summer Intern Support.” Sponsor: HPCMP. Funding: \$37,000.

“Power Grid Data Collection and Analysis.” Sponsor: LTS. Funding: \$15,000 – Hopkinson 55%, McTasney 45%.

#### REFEREED JOURNAL PUBLICATIONS

Kleeman, M.P., Seibert, B.A., Lamont, G.B., Hopkinson, K.M., Graham, S.R., “Solving Multicommodity Capacitated Network Design Problems using Multiobjective Evolutionary Algorithms,” *IEEE Transactions on Evolutionary Computation*, Volume 16, Issue 4, August 2012, pp. 449-471.

Compton, M.D., Hopkinson, K.M., Peterson, G.L., Moore, J.T., “Using Modeling and Simulation to Examine the Benefits of a Network Tasking Order,” *Journal of Defense Modeling and Simulation: Applications, Methodology, Technology*, Volume 9, Issue 3, July 2012, pp. 205-217.

Stuckey, N.C., Vasquez, J.R., Graham, S.R., Hopkinson, K.M., Maybeck, P.S., “Stochastic Control of Computer Networks,” *IET Control Theory and Applications*, Volume 6, Issue 3, 16 February 2012, pp. 403-411.

Kennedy, K.T., Deckro, R.F., Moore, J.T., Hopkinson, K.M., “Nodal Interdiction,” *Elsevier Mathematical and Computer Modeling*, Volume 54, Issues 11-12, December 2011, pp. 3116-3125.

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

Borowski, J.F., Hopkinson, K.M., Humphries, J.W., Borghetti, B.J., “Reputation-Based Trust for a Cooperative Agent-Based Backup Protection Scheme,” *IEEE General Power Meeting*, 22-27 July 2012, San Diego, CA, USA, pp. 1-1.

Reynolds, M.B., Hulce, D.R., Hopkinson, K.M., Oxley, M.E., Mullins, B.E., “Cloud Chamber: A Self-Organizing Facility to Create, Exercise, and Examine Software as a Service Tenants,” *IEEE Hawaii International Conference on System Sciences*, 4-7 January 2012, Maui, HI, USA, pp. 5546-5555.

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

Knight, M.P., Raulston, K., Laviers, K.R., Hopkinson, K.M., “The Use of Artificial Intelligence for Enhanced Network Defense,” *IEEE International Defense and Homeland Security Simulation Workshop (DHSS)*, 19-21. [ANT]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Program Committee Member 2012 IEEE Symposium on Wireless Telecommunications Applications (ISWTA), Bandung, Indonesia, September 23-26, 2012.

Program Committee Member 2012 IEEE 1st International Conference on Service Economics (SE), Honolulu, Hawaii, USA, June 24-29, 2012.

Program Committee Member 2012 IARIA 3rd International Conference on Cloud Computing, GRIDS, and Virtualization (CLOUD COMPUTING), Nice, France, July 22-27, 2012.

**HOUPIS, CONSTANTINE H.**

Professor Emeritus of Electrical Engineering, Department of Electrical and Computer Engineering, (AFIT/ENG); BS, University of Illinois, 1947; MS, University of Illinois, 1948; PhD, University of Wyoming, 1971. His research interests include guidance and control of aerospace vehicles, application of optimal control theory to engineering systems, flight control systems, digital control systems, computational and numerical methods for control systems design, linear and nonlinear control theory, multivariable theory, and quantitative feedback theory. Professor Houpis' has published numerous technical articles and textbooks. He is registered professional engineer and a Fellow of the IEEE. Tel. 937-255-3636 x4615 9 (DSN 785-3636 x4615), email: [Constantine.Houpis@afit.edu](mailto:Constantine.Houpis@afit.edu).

**BOOKS AND CHAPTERS IN BOOKS**

"Wind Energy Systems Control Engineering Design," co-authored with Professor Mario Garcia-Sanz of Case Western Reserve University was published by CRC PRESS Taylor & Francis Group in January, 2012.

**HYDE, MILO W., Maj,**

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. He is a member of IEEE, SPIE, and OSA. Tel. 937-255-3636 x4371 (DSN 785-3636 x4371), email: [Milo.Hyde@afit.edu](mailto:Milo.Hyde@afit.edu)

**SPONSOR FUNDED RESEARCH PROJECTS**

"Material Estimation Polarization Phenomenology Research." Sponsor: AFRL/RD. Funding: \$30,000.

"Phase Unwrapping Experiments in Strong Turbulence." Sponsor: AFOSR. Funding: \$68,000. [CDE]

"Extended Beacons: Modeling, Characterization and Atmospheric Compensation." Sponsor: AFOSR. Funding: \$20,000.

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

M. J. Havrilla, A. E. Bogle, M. W. Hyde, and E. J. Rothwell, "Electromagnetic material characterization of a curved conductor-backed media using an NDE microstrip probe," Proceedings of the 17th International Workshop on Electromagnetic Nondestructive Evaluation (ENDE), pp. 60-61, Rio De Janeiro, Brazil, Aug 2012.

M. Spencer and M. W. Hyde, "An investigation of stair mode in optical phased arrays using tiled apertures," Proceedings of SPIE (SPIE Optics and Photonics), Vol. 8520, 15 pp., San Diego, CA, Aug 2012.

M. Kim and M. W. Hyde, "Adaptive binary material classification of an unknown object using polarimetric imagery degraded by atmospheric turbulence," Proceedings of SPIE (SPIE Optics and Photonics), Vol. 8500, 11 pp., San Diego, CA, Aug 2012.

M. Steinbock and M. W. Hyde, "Reduced Noise propagation from least squares wavefront reconstruction using a post-processing congruence reconstruction technique," Proceedings of SPIE (SPIE Optics and Photonics), Vol. 8517, 16 pp., San Diego, CA, Aug 2012.

M. Hyde and M. Havrilla, "Design of an open-ended coaxial probe for broadband, low-footprint Nondestructive characterization of PEC-backed materials," IEEE International Instrumentation and Measurement Technology Conference (I<sup>2</sup>MTC) Proceedings, pp. 1599-1602, Graz, Austria, May 2012.

S. Basu, S. J. Cusumano, M. W. Hyde IV, M. A. Marciniak, and S. T. Fiorino, "Validity of using Gaussian Schell model for extended beacon studies," Proceedings of SPIE (SPIE Defense, Security, and Sensing 2012), Vol. 8380, 13 pp., Baltimore, MD, Apr 2012.

M. Steinbock, J. Schmidt, and M. Hyde, "Comparison of branch point tolerant wavefront reconstructors in the presence of simulated noise effects," IEEE Aerospace Conference (AeroConf) Proceedings, pp. 1-13, Big Sky, MT, Mar 2012.

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

M. Hyde, M. Havrilla, A. Bogle, and E. Rothwell, "Nondestructive material characterization of a free-space-backed magnetic material using a dual-waveguide probe," *IEEE Transactions on Antennas and Propagation*, Vol. 60, No. 2, pp. 1009-1019, Feb 2012.

M. Seal, M. Hyde, and M. Havrilla, "Nondestructive complex permittivity and permeability extraction using a two-layer dual-waveguide probe measurement geometry," *Progress in Electromagnetic Research*, Vol. 123, pp. 123-142, 2012.

M. Steinbock and M. W. Hyde, "Comparison of wavefront reconstruction techniques for extended turbulence beam projection applications," Directed Energy Professional Society (DEPS) Beam Control Conference, p. 15, Broomfield, CO, Jun 2012.

M. Havrilla and M. Hyde, "Complex media, symmetry and material properties," Material Measurement Working Group Conference Proceedings, 1 p., Rapid City, SD, Oct 2011.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Judge for SPIE's Optics and Photonics Science Fair Awards; 63rd Annual State Science Day; Columbus, OH; 7 May 2012.

Eta Kappa Nu (Delta Xi Chapter) Outstanding Teaching Award for Electrical and Computer Engineering; Mar 2012.

Reviewer of *Progress in Electromagnetics Research* manuscript "Numerical simulations of dielectric properties and experimental validation using rectangular waveguide structure in the Ku band," Apr 2012.

Session chair for *IEEE Aerospace Conference (AeroConf)*, Big Sky, MT, Mar 2012.

#### **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 electrodynamic and statistical modeling, radar imaging algorithms, and radar signal exploitation. She is a member of Tau Beta Pi and IEEE. Tel. 937-255-3636 x4678 (DSN 785-3636 x4678), email: [Julie.Jackson@afit.edu](mailto:Julie.Jackson@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

"Structured-Sparsity for Polarimetric Radar Imaging." Sponsor: AS&T. Funding: \$26,000.

"Polarization-Based Feature Extraction." Sponsor: AS&T. Funding: \$17,500.

"Compact Feature Representation of Discriminatory Scattering Phenomenology Extracted from Sparse Aperture 3DSAR Data." Sponsor: AFOSR. Funding: \$73,800.

"Passive Radar Imaging and Signal Selection." Sponsor: NASIC. Funding: \$25,000.

“Bistatic Radar Technology Development and Signal Exploitation.” Sponsor: AFRL/R.Y. Funding: \$50,000.

“Analysis of Parametric Models as Attributed Features for SAR ATR.” Sponsor: AFRL/R.Y. Funding: \$10,000.

#### REFEREED JOURNAL PUBLICATIONS

J. A. Jackson, “Closed-Form Geometrical/Physical Optics Solution for Bistatic, 3D Scattering from a Dihedral Corner,” *IEEE Transactions on Antennas and Propagation*, March 2012, pp. 1486-1495.

J. A. Jackson and R. L. Moses, “Synthetic Aperture Radar 3D Feature Extraction for Arbitrary Flight Paths,” *IEEE Trans. on Aerospace and Electronic Systems*, Vol. 48, No. 3, pp. 2065-2084, July 2012. [ANT]

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

M. Saville, D. Fuller, and J. A. Jackson, “Advances in Polarimetric Synthetic Aperture Radar,” 2012 IEEE International Symposium on Antennas and Propagation and USNC/URSI National Radio Science Meeting in Chicago, IL, USA, July 8-13, 2012.

J. A. Jackson, M. Rapson, and J. Gutierrez, “Passive Multi-Static SAR using OFDM Signals of Opportunity,” MSS Tri-Service Radar Conference, Boulder, CO, June 18-22, 2012, TP12 pp. 1-15. [ANT]

J. Gutierrez and J. A. Jackson, “Range Profiles from an Experimental OFDM Passive Radar,” 2012 International Waveform Diversity and Design Conference, Kauai, Hawaii, January 2012, paper 7023, pp. 1-5. [ANT]

D. F. Fuller, D. E. Hack, S. Sutara, A. Tempelis, M. Jussaume, M. A. Saville, and J. A. Jackson, “Integrating electromagnetics and signal processing into new radar algorithms,” (*invited paper*) International Conference on Electromagnetics in Advanced Applications (ICEAA), 2011, pp. 1330-1333. [ANT]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

B. Roadruck, A. Evers, and J. Jackson, “Measurement and Analysis of Ground Clutter in Bistatic Radar,” presentation in 7<sup>th</sup> annual Dayton Engineering Sciences Symposium (DESS), Wright State University, Oct 2011.

J. Jackson, G. Akers, J. Gutierrez, B. Roadruck, and A. Evers, “Experiments in the AFIT Radar Instrumentation Laboratory,” poster in 7<sup>th</sup> annual Dayton Engineering Sciences Symposium (DESS), Wright State University, Oct 2011.

#### **LAMONT, GARY B.,**

Professor in the Department of Electrical and Computer Engineering, AFIT Appointment Date: 1970 (AFIT/ENG), BS 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, intrusion and anomaly detection, 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. Dr. Lamont was also an engineering systems analyst for the Honeywell Aerospace Division for 6 years. He is a member of IEEE (senior member) ACM, ASEE, SIAM, Tau Beta Pi and Eta Kappa Nu. Tel. 937-255-3636x4718; email: [Gary.Lamont@afit.edu](mailto:Gary.Lamont@afit.edu)

#### REFEREED JOURNAL PUBLICATIONS

Mark P. Kleeman, Benjamin A. Seibert, Gary B. Lamont, Kenneth M. Hopkinson and Scott R. Graham  
*Solving Multicommodity Capacitated Network Design Problems using Multiobjective Evolutionary Algorithms*, IEEE Transactions on Evolutionary Algorithms, Volume 16, No. 4, pp 449-471, Aug. 2012.

Weissgerber, K., Lamont, G.B., Borghetti, B.J., and Peterson, G.L., "Determining Solution Space Characteristics for Real Time Strategy Games & Characterizing Winning Strategies," *Computer Games Technology Journal*, Vol. 2011, 2011, pp. 1-17. DOI:10.1155/2011/834026. [ANT]

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

Jeremy Stringer, Gary Lamont, and Geoffrey Akers, "Multi-Objective Evolutionary Algorithm Determined Radar Phase Codes," *IEEE Radar Conference*, ISBN 978-1-4673-0658-4, pp. 161-166, May, 2012. [ANT]

Jeremy Stringer, Geoffrey Akers, and Gary Lamont, "Consideration for Adaptive Wideband Digital Beamforming for MUD-WASP," *Tri-Services Radar Symposium*, June, 2012.

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

Jeremy Stringer, Gary Lamont, and Geoffrey Akers, "Radar Phase-Coded Waveform Design using MOEAs," *IEEE Congress on Evolutionary Computation (CEC)*, July, 2012.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Technical Chair, IEEE National Aerospace and Electroinics Conference (NAECON), Dayton, Ohio, July 25-27, 2012. [ANT]

#### **LANGLEY, DERRICK, Capt,**

Assistant Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT  
Appointment Date: 2011 (AFIT/ENG), BS, Electrical Engineering, University of Central Florida, 2003; MS, Electrical Engineering, Wright State University, 2007. PhD, Air Force Institute of Technology, 2012. His research interests include microelectronics, microelectromechanical systems (MEMS), nanotechnology, optics and metamaterials. His areas of expertise include design, fabrication and testing of micro/nano devices. He is a member of SPIE, Eta Kappa Nu and SEM. Tel. 937-255-3636 x6165 (DSN 785-3636 x6165), email: [Derrick.Langley@afit.edu](mailto:Derrick.Langley@afit.edu)

#### REFEREED JOURNAL PUBLICATIONS

Langley, D., Coutu, R. A., Collins, P. J., "Using Inductance as a Tuning Parameter for RF Meta-atoms," *Nano-Micro Letters*, Vol. 4, No. 2, pp. 103-109, July 2012.

Moore, E. A., Langley, D., Jussaume, M. E., Rederus, L. A., Lundell, C. A., Coutu Jr., R. A., Collins, P. J., Starman, L. A., "SRRs Embedded with MEMS Cantilevers to Enable Electrostatic Tuning of the Resonant Frequency," *Experimental Mechanics*, Vol. 52, No. 4, pp. 395-403, April 2012.

Langley, D., Coutu, R. A., Collins, P. J., "Low-loss meta-atom for improved resonance response," *American Institute of Physics Advances*, Vol. 2, No. 012196, pp. 1 – 5, Jan-Mar 2012.

Moore, E. A., Langley, D., Jussaume, M. E., Coutu Jr., R. A., Collins, P. J., Starman, L. A., "Electrostatically Tunable Meta-Atoms Integrated with In-Situ Fabricated MEMS Cantilever Beam Arrays," *IEEE/ASME Journal of Microelectromechanical Systems*, Vol. 20 No. 6, pp. 1366 – 1371, December 2011.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Session Chair at 2012 Society of Experimental Mechanics International Congress & Exposition on Experimental & Applied Mechanics, Costa Mesa CA, June 2012.

#### **LANZEROTTI, MARY Y.,**

Associate Professor of Computer Engineering, Department of Electrical and Computer Engineering, AFIT  
Appointment Date: 2011 (AFIT/ENG), AB, Harvard University, 1989; MPhil, University of Cambridge (UK), 1991; MS Cornell University, 1994; PhD, Cornell University, 1997. Her research interests include VLSI design and analysis. She is a member of the IEEE (Senior Member), IEEE Press Editorial Board (elected member), ASEE, APS Committee on Education, CUR, and Phi Beta Kappa. She is Editor-in-Chief of the IEEE Solid-State Circuits Magazine and completed ABET Program Evaluator training. She holds four U.S. patents. Tel. 937-255-3636 x4442 (DSN 785-3636 x4442), email: [Mary.Lanzerotti@afit.edu](mailto:Mary.Lanzerotti@afit.edu)

#### SPONSOR FUNDED EDUCATIONAL PROJECTS

“Assessment of Random Matrix Theory and Physical Design Optimization of Integrated Circuits.” Sponsor: NSF. Funding: \$5,000.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

IEEE Press Editorial Board, Elected Member. One of twelve elected members (out of 400,000 IEEE members worldwide). One Annual in-person meeting per year. (One three-year term: 2010-2012)

APS Committee on Education, Appointed Member. Member of K-12 Subcommittee. Two annual in-person meetings per year (One three-year term: 2010-2012). One of 10 members.

IEEE *Solid-State Circuits*, Editor-in-Chief; \$180,000 annual budget; four issues per year (11,000 members of IEEE Solid-State Circuits Society worldwide). Three meetings per year (including annual IEEE Panel of Editors meeting). (Editor with IEEE publications since 1995).

IEEE Technical Activities Board member (TAB).

National Science Foundation Site Visit Panel Review Team 2012 for annual renewal of \$20M, five-year program at the Center for Hierarchical Manufacturing (CHM) at the University of Massachusetts, Amherst. One of seven members of Site Visit Team (SVT). (Repeat SVT member; Invited to participate previously on 2010 NSF SVT).

Volunteered as a Judge at West District Science Day at Central State University (Wilberforce, OH) on 17 March 2012 for over 400 students in Grades 5-12 from 180 public and private schools.

#### **LAVIERS, KENNARD R., Maj,**

Assistant Professor of Computer Science, Department of Electrical and Computer Engineering, AFIT  
Appointment Date: 2011 (AFIT/ENG), BSCS, University of Texas at El Paso, 2000; MSCS, Air Force Institute of Technology, 2004; PhD, University of Central Florida, 2011. His research interests include artificial intelligence, multi-agent learning, and opponent modeling. Tel. 937-255-3636 x4395 (DSN 785-3636 x4395), email: [Kennard.Laviers@afit.edu](mailto:Kennard.Laviers@afit.edu)

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Served in Qatar and Afghanistan in the Central Command (CENTCOM) training staff (J7) as a training officer for six weeks. Played a key role in developing Fragmented Orders (FRAGOs) to ensure all U.S. military serving in Afghanistan received appropriate language and cultural training.

Program committee member for AAAI Conference 2012 (reviewed 7 papers), SIMULTECH Conference 2012 (reviewed 3 papers), INTELLI Conference 2012 (reviewed 1 paper), and AIIDE Conference 2012 (reviewed 3 papers).

Editorial review board for the Journal of Information Technology & Software Engineering, reviewed 1 paper.

Member IEEE and AAAI.

**LOUTHAIN, JAMES A., Lt Col,**

Assistant Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT Appointment Date 2012 (AFIT/ENG), BS, Electrical Engineering, University of Portland, 1991; MS, Electrical Engineering, Air Force Institute of Technology, 1997; PhD, Air Force Institute of Technology, 2008. His research interests include electronic warfare, infrasound Technology, free-space optical communication, atmospheric turbulence compensation, and electro-optic tracking. He is a member of the Tau Beta Pi, Eta Kappa Nu, and the Optical Society of America. Tel. 937-255-3636 x4620 (DSN 785-3636 x4620), email: [James.Louthain@afit.edu](mailto:James.Louthain@afit.edu)

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Reviewer for Book Proposal: *The Fine Art of Electronic Warfare, with MATLAB*, by Dr. Ron Milione, by SciTech Publishing, February 2012.

**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 source localization, navigation, radio tomographic imaging, and 3D laser radar imaging. Tel. 937-255-3636 x4625 (DSN 785-3636 x4625), email: [Richard.Martin@afit.edu](mailto:Richard.Martin@afit.edu)

SPONSOR FUNDED RESEARCH PROJECTS

“RF Anomaly Detection for Intent Assessment.” Sponsor: ONR. Funding: \$97,000.

“Distributed TDOA-Based Source Localization.” Sponsor: AFOSR. Funding: \$32,171 – Martin 50%, Fisher 50%. [ANT]

“Physical Modeling of Radio Tomographic Imaging.” Sponsor: AFOSR. Funding: \$30,454.

REFEREED JOURNAL PUBLICATIONS

R. K. Martin, “Using Alpha Shapes to Approximate Signal Strength Based Positioning Performance,” *IEEE Signal Processing Letters*, Vol. 18, No. 12, December 2011, pp. 741-744. [ANT]

R. G. Machado, A. G. Klein, and R. K. Martin, “Sparsening Filter Design for Iterative Soft-Input Soft-Output Detectors,” *EURASIP Journal on Wireless Communications and Networking*, special issue on Algorithm and Implementation Aspects of Channel Codes and Iterative Receivers, Vol. 2012, Art. No. 72, Feb 2012, pp. 1-10.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

R. K. Martin, C. Anderson, R. W. Thomas, and A. S. King, “Modeling and Analysis of Radio Tomography,” in *Proc. The Fourth International Workshop on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP)*, San Juan, Puerto Rico, December 2011, pp. 161-164.

A. S. King and R. K. Martin, “The Benefits of Game Use in a Signal Processing Graduate Class,” submitted to *Proc. Int’l. Conf. on Acoustics, Speech, and Signal Processing*, Kyoto, Japan, Mar 2012. [ANT]



R. K. Martin, "How Valid is the Regularly-Spaced Grid Assumption in RSS Source Localization Sensor Networks?," in *Proc. IEEE Workshop on Statistical Signal Processing*, Ann Arbor, MI, Aug 2012, 4 pages. [ANT]

E. A. Buschelman and R. K. Martin, "Nonparametric Methods for Full-Waveform Ladar Images," in *Proc. IEEE Workshop on Statistical Signal Processing*, Ann Arbor, MI, Aug 2012, 4 pages.

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

R. Lenahan, B. Christel, C. Lawyer, and R. K. Martin, "Radio Tomographic Imaging and Geolocation Using Sun Spots," poster presentation at *IEEE SENSORS 2011 Conf.*, Limerick, Ireland, Oct 2011. [ANT]

M. Butler, R. K. Martin, and R. Lenahan, "Low Cost Sensor Design for Non-Cooperative Geolocation via RSS," poster presentation at *European Conference on Wireless Sensor Networks*, Trento, Italy, Feb 2012. [ANT]

R. G. Machado, A. G. Klein, and R. K. Martin, "Decision Feedback Sparsening Filter Design for Belief-Propagation Detectors," in *Proc. 46th Annual Conference on Information Sciences and Systems*, Princeton, NJ, March 2012.

A. Brueggen, L. Burchett, S. Hartzell, J. Pennington, J. Wilson, R.K. Martin, A. Terzuoli, E. Walton, and A. Tubbs, "Aerostat Communication Design," in *Proc. 15th Int'l. Symposium on Antenna Technology and Electromagnetics*, Toulouse, France, June 2012, 3 pages.

#### PATENTS

Richard K. Martin, Jamie S. Velotta, and John F. Raquet, "Multicarrier Modulation Navigation with a Signal of Opportunity," United States Patent #8072383, issued on 06 Dec 2011. [ANT]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Technical Program Committee member, *The 26<sup>th</sup> Biennial Symposium on Communications*, Queen's University, Kingston, Ontario, May 2012.

#### **MCTASNEY, ROBERT J., LTC,**

Assistant Professor of Computer Engineering, AFIT Appointment Date: 1 March 2012 (AFIT/ENG), BS, Electrical Engineering, Texas A&M University, 1987; MS, Electrical Engineering, University of Colorado at Boulder, 1997; PhD, Electrical Engineering, University of Colorado at Boulder, 2008. His research interests include wireless mesh networking, software-defined radio, cognitive radio, embedded systems applications, robotics, and reconfigurable computing. Tel. 937-255-3636 x4460 (DSN 785-3636 x4460), e-mail: [Robert.Mctasney@afit.edu](mailto:Robert.Mctasney@afit.edu)

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

ACE (Advanced Cyber Education) Advisor for two undergraduate students a part of the Flash Memory Data Extraction Project for Summer 2012. [CCR]

#### **MILLS, ROBERT F.,**

Associate 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, insider threat mitigation, and electronic warfare. He is a Senior Member of the IEEE and is a member of the Eta Kappa Nu and Tau Beta Pi honor societies. Tel. 937-255-3636 x4527 (DSN 785-3636 x4527), email: [Robert.Mills@afit.edu](mailto:Robert.Mills@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

“Cognitive Electronic Warfare.” Sponsor: AFRL/R.Y. Funding: \$10,000. [CCR]

#### REFEREED JOURNAL PUBLICATIONS

Grimaila, M.R., Myers, J., Mills, R.F., and Peterson, G., “Design and Analysis of a Dynamically Configured Log-based Distributed Security Event Detection Methodology,” *The Journal of Defense Modeling and Simulation: Applications, Methodology, Technology*, Sage Press, DOI: 10.1177/1548512911399303, Vol. 9(3), pp. 219-241, July 2012. [CCR]

Bryant, A.R., Mills, R.F., Peterson, G.L., and Grimaila, M.R., “Software Reverse Engineering as a Sensemaking Task,” *Journal of Information Assurance and Security*, Vol. 6, Issue 6, pp. 483-494, 2011. [CCR]

Birdwell, M.B., and Mills, R., “Warfighting in Cyberspace: Evolving Force Presentation and Command and Control,” *Air and Space Power Journal – Spanish Edition*, 4th Qtr, 2011. [CCR]

Lacey, T.H., Mills, R.F., Mullins, B.E., Raines, R.A., Oxley, M.E., and Rogers, S.K., “RIPsec – Using Reputation-Based Multilayer Security to Protect MANETs,” *Computers & Security*, Vol. 31:1, Feb 2012, pp. 122–136, DOI:10.1016/j.cose.2011.09.005. [CCR]

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

Evans, M., Grimaila, M.R., and Mills, R.F., “A Survey of Cyberspace Mission Assurance Within United States Air Force Communications Squadrons,” 2012 International Conference on Security and Management (SAM12), Las Vegas, Nevada, July 16-19, 2012. [CCR]

Barcomb, K., Krill, J., Mills, R., and Saville, M. “Establishing Cyberspace Sovereignty,” International Conference on Information Warfare and Security (ICIW 2012), March 22-23, 2012, pp. 1-9. [CCR]

Barcomb, K.E., Humphries, J.W., and Mills, R.F., “A Case for DOD Application of Public Cloud Computing Services,” 2011 Military Communications Conference (MILCOM 2011), Nov. 7-10, 2011, pp. 19-26. [CCR]

#### BOOKS AND CHAPTERS IN BOOKS

Thomas, B., Mullins, B.E., Peterson, G.L., and Mills, R.F., “An FPGA System for Detecting Malicious DNS Network Traffic,” *Advances in Digital Forensics VII*, IFIP Advances in Information and Communication Technology, G.L. Peterson and S. Shenoi, Ed., Boston: Springer, 2011, pp. 195-207. [CCR]

Haas, M.W., Mills, R.F., and Grimaila, M.R., “Aiding Understanding of Contested Information Environment Affect on Operations,” *Human-in-the-loop Simulation: Methods and Practice*, S. Narayanan, ed., London: Springer-Verlag, 2011, pp. 175-202. [CCR]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Kelly, D.J., Grimaila, M.R., and Mills, R.F., “Cyber Incident Mission Impact Assessment (CIMIA),” Air Force Technical Report AFRL-RH-WP-TR-2012-0001, January 2012.

#### **MULLINS, BARRY E.,**

Associate 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, malware analysis, reverse code engineering, computer/network security, SCADA (supervisory control and

data acquisition) security, computer communication networks, embedded (sensor) and wireless networking, and reconfigurable computing systems. Tel. 937-255-3636 x7979 (DSN 785-3636 x7979), email: [Barry.Mullins@afit.edu](mailto:Barry.Mullins@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

“Development and Implementation of a Testbed for Research and Analysis of Malware.” Sponsor: DHS. Funding: \$220,000 – Mullins 40%, Humphries 20%, Butts 20%, Robinson 20%. [CCR]

#### SPONSOR FUNDED EDUCATIONAL PROJECTS

“IASP Tuition and Resource Support for the AFIT Center for Cyberspace Research (CCR).” Sponsor: NIETP. Funding: \$128,921 – Mullins 50%, Raines 50%. [CCR]

#### REFEREED JOURNAL PUBLICATIONS

D. J. Kelly, R. A. Raines, R. O. Baldwin, M. R. Grimaila and B. E. Mullins, “Exploring Extant and Emerging Issues in Anonymous Networks: A Taxonomy and Survey of Protocols and Metrics,” IEEE Communications Surveys and Tutorials, Vol. 14, No. 2, June 2012, pp. 579-606. [CCR]

T. H. Lacey, R. F. Mills, B. E. Mullins, R. A. Raines, M. E. Oxley, and S. K. Rogers, “RIPsec – Using Reputation-Based Multilayer Security to Protect MANETs,” Computers & Security, Vol. 31, No. 1, February 2012, pp. 122-136. [CCR]

D. T. Merritt and B. E. Mullins, “Identifying Cyber Espionage: Towards a Synthesis Approach,” Journal of Network Forensics, Vol. 3, No. 1, Autumn 2011, pp. 48-59. [CCR]

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

B. E. Mullins, “Developing Cyber Warriors from Computer Engineers et al.,” 2012 American Society for Engineering Education Annual Conference, San Antonio, TX, June 2012, pp. 1-12. [CCR]

#### BOOKS AND CHAPTERS IN BOOKS

B. D. Thomas, B. E. Mullins, G. L. Peterson and R. F. Mills, “An FPGA System for Detecting Malicious DNS Network Traffic,” Advances in Digital Forensics VII, G. Peterson and S. Sheno, eds., Springer Science+Business Media, New York, NY, 13 Oct 11, pp. 195-208. [CCR]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Member, Technical Program Committee for the 8th International Conference on Information Warfare and Security (ICIW 2013).

Reviewer, American Society for Engineering Education (ASEE), Computers in Education Division, ASEE Annual 2012 Conference.

Reviewer, 11th European Conference on Information Warfare and Security (ECIW 2012).

Member, Selection Committee for the 2012 IEEE Eta Kappa Nu C. Holmes MacDonald Outstanding Teaching Award.

**PACHTER, MEIR,**

Professor, Department of Electrical and Computer Engineering, AFIT Appointment Date: 1993 (AFIT/ENG); BS, Israel Institute of Technology, 1967; MS, Israel Institute of Technology, 1969; PhD, Israel Institute of Technology, 1975. Dr. Pachter's fields of expertise include automatic control of aircraft and missiles, adaptive control and system identification, inertial and GPS navigation, autonomous control/neural networks/fuzzy logic control, nonlinear control, and applied mathematics. Dr. Pachter has published papers in these areas and in differential games, robotics, and the theory of computational geometry. Dr. Pachter is interested in the application of mathematics to the solution of engineering and scientific problems. His current areas of interest include military operations optimization, cooperative control, estimation and optimization, statistical signal processing, adaptive optics, inertial navigation, and GPS navigation. For his work on adaptive and reconfigurable flight control, he received the AF Air Vehicle's Directorate Foulis award for 1994, together with Phil Chandler and Mark Mears. Tel. 937-255-3636 x7247 (DSN 785-3636 x4593), email: [Meir.Pachter@afit.edu](mailto:Meir.Pachter@afit.edu)

**SPONSOR FUNDED RESEARCH PROJECTS**

"Decision Support Techniques." Sponsor: AFRL/RV. Funding: \$10,000. [ANT]

"Cooperative Control." Sponsor: AFRL/RB. Funding: \$20,000. [ANT]

"Games, Information and Deception Exploitation for Adversarial Network Systems." Sponsor: AFOSR. Funding: \$52,415. [ANT]

**REFEREED JOURNAL PUBLICATIONS**

M. Pachter, "Kalman Filtering When the Large Bandwidth Control is Not Known," IEEE Trans. on Aerospace and Electronic Systems, Vol. 48, No. 1, January 2012, pp. 542-551. [ANT]

M. Pachter, "Kalman Filtering When the Large Bandwidth Control is Not Known," IEEE Trans. On Aerospace and Electronic Systems, Vol. 48, No. 1, January 2012, pp. 542-551. [ANT]

K. Krishnamoorthy, P. Chandler, M. Pachter and S. Dharba, "Optimization of Perimeter Patrol Operations Using Unmanned Aerial Vehicles," AIAA Journal of Guidance, Control and Dynamics, Vol. 35 No. 2, March-April 2012, pp. 434-441. [ANT]

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

M. Pachter, "The Informativeness of Discrete Measurements," 52st Israel Annual Conference on Aerospace Sciences, Haifa, Israel, February 29-March 1 2012. [ANT]

K. Kalyanam, M. Pachter and P. Chandler, "Optimal UAV Search for a Random Moving Ground Target," AIAA Infotech Aerospace 2012, 19 - 21 June 2012, Garden Grove, CA. [ANT]

K. Kalyanam, S. Dharba, M. Pachter and P. Chandler, "Bounding Procedures for Stochastic Dynamic Programs with Applications to the Perimeter Patrol Problem," American Control Conference, Paper FrB18.4, Montreal, Canada, June 27-29, 2012. [ANT]

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

"Information, Decentralization and Autonomy in Networked Systems," International Conference on the Dynamics of Information Systems, Gainesville, FL, 20-22 February 2012. [ANT]

"UAV Search & Capture of a Moving Ground Target," GIDEANS Review, Boston, MA, April 12, 2012. [ANT]

## BOOKS AND CHAPTERS IN BOOKS

M. Pachter and K. Pham, "Information Patterns in Discrete-Time Linear-Quadratic Dynamic Games," in *Sensors: Theory, Algorithms and Applications*, P.M. Pardalos, V. Boginski, C. Commander and Y. Ye, Eds., Springer, August 2012, pp. 61-94. [ANT]

K. Pham and M. Pachter, "Information Considerations in Multi-Person Cooperative Control/Decision Problems: Information Sets, Sufficient Information Flows and Risk Averse Decision Rules for Performance Robustness," in *Sensors: Theory, Algorithms and Applications*, P.M. Pardalos, V. Boginski, C. Commander and Y. Ye, Eds., Springer, August 2012. [ANT]

K. Pham and M. Pachter, "Modeling Interactions in Complex Systems: Self-Coordination, Game -Theoretic Design Protocols, and Performance-Reliability Aided Decision Making," in *Sensors: Theory, Algorithms and Applications*, P.M. Pardalos, V. Boginski, C. Commander and Y. Ye, Eds., Springer, August 2012. [ANT]

## **PETERSON, GILBERT L.,**

Associate Professor of Computer Science, Department of Electrical and Computer Engineering, AFIT  
Appointment Date: 2002 (AFIT/ENG); BS Architecture University of Texas at Arlington, 1995; MS, Computer Science, University of Texas at Arlington, 1998; PhD, University of Texas at Arlington, 2001. 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](mailto:Gilbert.Peterson@afit.edu)

## SPONSOR FUNDED RESEARCH PROJECTS

"Maximization of Observability in Navigation for Autonomous Robotic Control (MONARC)." Sponsor: AFRL/RV. Funding: \$54,887 – Peterson 80%, Raquet 20%. [ANT]

## REFEREED JOURNAL PUBLICATIONS

Dube, T., Raines, R., Peterson, G.L., Bauer, K., Grimaila, M.R., and Rogers, S., "Malware Target Recognition via Static Heuristics," *IEEE Computer & Security*, Vol. 31, No. 1, 2012, pp. 137-147. DOI: 10.1016/j.cose.2011.09.002. [CCR]

Okolica, J., and Peterson, G.L., "Windows Driver Memory Analysis: A Reverse Engineering Methodology," *IEEE Computers & Security*, Vol. 30, 2011, pp.770-779. DOI: 10.1016/j.cose.2011.08.001. [CCR]

Peterson, G.L., Hooper, D.J., and Duffy, J., "Dynamic Behavior Sequencing for Hybrid Robot Architectures," *Journal of Intelligent and Robotic Systems*, Vol. 64, No. 2, 2011, pp. 179-196, DOI: 10.1007/s10846-010-9535-3. [ANT]

Okolica, J., and Peterson, G.L., "Extracting the Windows Clipboard from Physical Memory," *Digital Investigation: The International Journal of Digital Forensics & Incident Response*, Vol. 8, sup. 1, 2011, pp. S118-S124. DOI: 10.1016/j.din.2011.05.014. [CCR]

Bryant, A., Mills, R.F., Peterson, G.L., and Grimaila, M.R., "Software Reverse Engineering as a Sensemaking Task," *International Journal of Information Assurance and Security*, Vol. 6, No. 6, 2011, pp. 483-494. [CCR]

Weissgerber, K., Lamont, G.B., Borghetti, B.J., and Peterson, G.L., "Determining Solution Space Characteristics for Real Time Strategy Games & Characterizing Winning Strategies," *Computer Games Technology Journal*, Vol. 2011, 2011, pp. 1-17. DOI:10.1155/2011/834026. [ANT & CCR]

Karrels, D.R., Peterson, G.L., and Mullins, B.E., "Large-scale Cooperative Task Distribution on Peer-to-Peer Networks," *Web Intelligence and Agent Systems* (Accepted: February 2012). [CCR]

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

Hay, A., and Peterson, G.L., "Acquiring OS X File Handles through Forensic Memory Analysis," *IEEE Systematic Approaches to Digital Forensics*, Vancouver, BC, Canada, 2012. [CCR]

Vongsy, K., Mendenhall, M.J., Eismann, M.T., and Peterson, G.L., "Removing Parallax-Induced Changes in Hyperspectral Change Detection," *IEEE International Geoscience and Remote Sensing Symposium* (Accepted: March 2012).

Bryant, A.R., Mills, R.F., Peterson, G.L., and Grimaila, M.R., "Eliciting a sensemaking process from verbal protocols of reverse engineers," *Proceedings of the Annual Meeting of the Cognitive Science Society*, Sapporo Japan, Aug 1-4, 2012. [CCR]

#### BOOKS AND CHAPTERS IN BOOKS

Peterson, G.L. and Shenoi, S., Eds. *Advances in Digital Forensics VIII*, New York, NY: Springer Science + Business Media, (in press) 2012. [CCR]

Hay, A., Krill, D., Kuhar, B., and Peterson, G.L., "Evaluating Digital Forensics Options for the Apple iPad," *Advances in Digital Forensics VII*, G.L. Peterson and S. Shenoi, Ed., Boston: Springer, 2011, pp. 257-274. [CCR]

Thomas, B.D., Mullins, B.E., Peterson, G.L., and Mills, R.F., "An FPGA System for Detecting Malicious DNS Network Traffic," *Advances in Digital Forensics VII*, G.L. Peterson and S. Shenoi, Ed., Boston: Springer, 2011, pp. 195-208. [CCR]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

*Vice-Chair*, International Federation for Information Processing, Working Group 11.9 – Digital Forensics.

*Committee Member*, Department of Defense Cyber Crime Center (DC3) Academic Cyber Curriculum Alliance (DACCA).

*Co-Chair*, Ninth Annual IFIP WG 11.9 International Conference on Digital Forensics.

#### **POCHET, MICHAEL C., Maj,**

Division Chief and 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](mailto:Michael.Pochet@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

"Cold Cathode Development Using Carbon Nanotubes on SiC." Sponsor: AFOSR. Funding: \$9,672.

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

Pochet, M., Harvey, E. P., Locke, T., and Usechak, N. G., "Transient Response of a Modulated Microwave Subcarrier Generated Using Optical Injection," *Proceedings of the IEEE Photonics Society Annual Meeting*, MC5(1-2), San Francisco, CA (Sep 2012).

Locke, T., Pochet, M., and Usechak, N. G., "On-Off Keyed Microwave Signal Optically Generated Using an Optically-Injected Fabry-Perot Semiconductor Laser," *Conf Proceeding, Conf on Lasers and Electro-Optics (CLEO) JW2A.88(1-2)*, San Jose, CA (May 2012).

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

Avrett, J. T., Cain, S. C., and Pochet, M., "Dynamic Thermal Analysis of a Concentrated Photovoltaic System," *Proc of SPIE - The International Society for Optical Engineering* 8256, 86561V-(1-11), San Francisco, CA (Jan 2012).

#### **RAINES, RICHARD A.,**

Director, Center for Cyberspace Research, Professor of Electrical Engineering, and DOD Force Transformation Chair, Department of Electrical and Computer Engineering, AFIT Appointment Date: 1994 (AFIT/ENG), BSEE, Florida State University 1985; MS, Computer Engineering, Air Force Institute of Technology, 1987; PhD, Virginia Polytechnic Institute and State University, 1994. His research interests include computer communication networks, satellite communications, performance modeling, information security, and system threat and vulnerability. Tel. 937-255-6565 x4278 (DSN 785-6565 x4278), email: [Richard.Raines@afit.edu](mailto:Richard.Raines@afit.edu)

#### REFEREED JOURNAL PUBLICATIONS

D. Kelly, R. Raines, R. Baldwin, B. Mullins, and M. Grimaila, "Exploring Extant and Emerging Issues in Anonymous Networks: A Taxonomy and Survey of Protocols and Metrics," *IEEE Communications Surveys and Tutorials*, Vol. 14, No. 2, 2012, pp. 579-606. [CCR]

T. Dube, R. Raines, G. Peterson, K. Bauer, M. Grimaila and S. Rogers, "Malware Target Recognition via Static Heuristics," *Computers and Security*, Vol. 31, Issue 1, February 2012, pp. 137-147. [CCR]

T. H. Lacey, R. F. Mills, B. E. Mullins, R. A. Raines, M. Oxley, and S. K. Rogers, "RIPsec – Using Reputation-Based Multilayer Security to Protect MANETs," *Computers and Security*, 31 (2012), pp. 122-136 DOI: 0.1016/j.cose.2011.09.005. [CCR]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Technical Paper Referee, 47<sup>st</sup> *Hawaii International Conference on System Sciences* (2 papers).

Member, Information Assurance Scholarship Program (IASP) selection board, Air Force Personnel Center, Randolph AFB, TX.

#### **RAQUET, JOHN F.,**

Director, Advanced Navigation Technology (ANT) Center; Associate Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT Appointment Date: 1998 (AFIT/ENG); BS, US Air Force Academy, 1989; MS, Massachusetts Institute of Technology, 1991; PhD, University of Calgary, Canada, 1998. Dr. Raquet's areas of interest include Global Positioning System (GPS) precise positioning, non-GPS precision navigation, optically-aided navigation, navigation using signals of opportunity, integration of MEMS-based inertial measurement units with other sensors, autonomous vehicle navigation and control, and electromagnetic interference and mitigation techniques affecting GPS performance. Tel. 937-255-3636 x4580 (DSN 785-3636 x4580), email: [John.Raquet@afit.edu](mailto:John.Raquet@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

"Use of Pseudolite Approach for Alternative PNT." Sponsor: FAA. Funding: \$50,000 – Raquet 34%, Jacques 33%, Mann 33%. [ANT]

"ANT Center Laboratory Support per Attachment 6 of the MOA between AFIT and AFRL." Sponsor: AFRL/RV. Funding: \$200,000 – Raquet 50%, Fisher 50%. [ANT]

"ANT Center Laboratory Support per Attachment 6 of the MOA between AFIT and AFRL." Sponsor: AFRL/RW. Funding: \$100,000 – Raquet 50%, Fisher 50%. [ANT]

“Ultra-High Accuracy Reference Systems (UHARS) Support.” Sponsor: 746 TS. Funding: \$140,000 – Raquet 90%, Fisher 10%. [ANT]

“Development of Electronic Warfare (EW) Trainer.” Sponsor: AFRL/RV. Funding: \$49,000. [ANT]

“Support for All-Source Positioning and Navigation (ASPN) Program Phase II.” Sponsor: DARPA. Funding: \$75,000 – Raquet 60%, Fisher 30%, Peterson 10%. [ANT]

#### REFEREED JOURNAL PUBLICATIONS

K. Kauffman, J. Raquet, J. Morton, D. Garmatyuk, “Real-Time UWB-OFDM Radar Based Navigation in Unknown Terrain,” IEEE Transactions on Aerospace and Electronic Systems, Feb 2012. [ANT]

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

M. Haker, J. Raquet, “Applying Detection Theory to Define Stopping Criteria for the Signal Decomposition and Parameterization Algorithm,” International Conference on Localization and GNSS 2012, Stanberg, Germany, Jun 2012. [ANT]

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

M. Haker and J. Raquet, “Tracking Multipath in Received GNSS Signals through use of a Signal Decomposition and Parameterization Algorithm,” Proceedings of 25<sup>th</sup> International Technical Meeting of The Satellite Division of the Institute of Navigation (ION GNSS 2012), Nashville, TN, 2012. [ANT]

Kauffman, K., J. Raquet, J. Morton, D. Garmatyuk, “Experimental Study of UWB-OFDM SAR for Indoor Navigation with INS Integration,” Proceedings of 25<sup>th</sup> International Technical Meeting of The Satellite Division of the Institute of Navigation (ION GNSS 2012), Nashville, TN, 2012. [ANT]

Shockley, J. and J. Raquet, “Three Axis Magnetometer Navigation in Suburban Areas,” Proceedings of 25<sup>th</sup> International Technical Meeting of The Satellite Division of the Institute of Navigation (ION GNSS 2012), Nashville, TN, 2012. [ANT]

Fisher, K., J. Raquet, and J. Kresge, “Affine Feature Matching via Stochastic Prediction,” Proceedings of 25<sup>th</sup> International Technical Meeting of The Satellite Division of the Institute of Navigation (ION GNSS 2012), Nashville, TN, 2012. [ANT]

Calhoun, S., J. Curro, and J. Raquet, “Flight Test Evaluation of Predictive Rendering Image Navigation for Close-Formation Flight,” Proceedings of 25<sup>th</sup> International Technical Meeting of The Satellite Division of the Institute of Navigation (ION GNSS 2012), Nashville, TN, 2012. [ANT]

Curro, J., T. Pestak, M. Smearcheck, J. Kresge, and J. Raquet, “Automated Aerial Refueling Using Scanning LiDAR,” Proceedings of 25<sup>th</sup> International Technical Meeting of The Satellite Division of the Institute of Navigation (ION GNSS 2012), Nashville, TN, 2012. [ANT]

#### PATENTS

Martin, R., J. Velotta, and J. Raquet, “Navigation and Position Determination with a Multicarrier Modulation Signal of Opportunity,” Patent No. 8,072,383, Issued 6 Dec, 2011. [ANT]

Morrison, J., J. Raquet, and M. Veth, “Coded Aperture Aided Navigation and Geolocation System,” Application No. 13/015,272, Notice of Allowance issued Apr 2012. [ANT]



#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Raquet, J. and J. Campbell, "GPS 101," Tutorial taught to 70 attendees of 2012 Joint Navigation Conference, Jun 2012. [ANT]

Raquet, J., "Calculation of GPS PNT Solution," presented to 53 industrial members and students from COUNT consortium, Jun 2012. [ANT]

Raquet, J., "Fundamentals of GPS Navigation and Receiver Processing," presented to 60 professors and students at Workshop on Science Application of GNSS in Developing Countries, Trieste, Italy, Apr 2012. [ANT]

J. Shockley and J. Raquet, "Vehicle Mounted Magnetometer Measurements for Navigation," presented at 2012 Joint Navigation Conference (JNC), Colorado Springs, CO, Jun 2012. [ANT]

DARPA, Consulting support for S-BUG and RSN navigation programs, Jan 2009 – present. [ANT]

Chairman, Institute of Navigation (ION) Satellite Division. [ANT]

Scientific (organizing) committee, International Conference on Ubiquitous Positioning, Indoor Navigation and Location-Based Service, Helsinki, Finland, Oct 2012. [ANT]

Awards Committee Member, Institute of Navigation. [ANT]

#### **ROBINSON, DAVID J., Lt Col,**

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](mailto:David.Robinson@afit.edu)

#### **SAMBORA, MATTHEW D., Col**

Senior Military Professor, Graduate School of Engineering and Management (AFIT/EN); BS, Clarkson University, 1988; MA, Webster University, 1994; MS, Southern Illinois University at Edwardsville, 1996; PhD, Air Force Institute of Technology, 2008. He was commissioned in 1988 through Air Force ROTC and has served in assignments covering developmental engineering, communications engineering and civil engineering. He is a 2002 graduate of Air Command and Staff College where he received a Master of Military Operational Art and Science and completed Air War College by correspondence. Colonel Sambora's research interests include image registration, remote sensing, multi-sensor data fusion, estimation bounds, Light Detection and Ranging (LIDAR), cloud computing, and large data analytics. Tel. 937-255- 3636 x4901 (DSN 785-3636), email: [Matthew.Sambora@afit.edu](mailto:Matthew.Sambora@afit.edu)

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Department of Defense Space Experiments Review Board - Member. [ANT]

IEEE Aerospace Conference, Image Processing Session Co-Chair. [ANT]

#### **SILVIUS, MARK D., Maj,**

Assistant Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT  
Appointment Date: 2009 (AFIT/ENG), BS, Cornell University, 1999; MS, Syracuse University, 2003; PhD, Virginia Polytechnic Institute and State University, 2009. His research interests are wireless communications and cognitive radio. Tel. 937-255-3636 x4684 (DSN 785-3636 x4684), e-mail: [Mark.Silvius@afit.edu](mailto:Mark.Silvius@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

“Technical Support: Cognitive Communications Research.” Sponsor: AFRL/R.Y. Funding: \$40,000 – Silvius 48%, Hopkinson 47%, Martin 5%.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Completed Air Command and Staff College (ACSC) via correspondence.

#### **STARMAN, LAVERN A., Lt Col,**

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

Starman, L.A. and Coutu, Jr., R.A. “Stress Monitoring of Post-Processed MEMS Silicon Microbridge Structures Using Raman Spectroscopy,” Journal of Experimental Mechanics, Digital Object Identifier (DOI) 10.1007/s11340-011-9586-9, pp. 1-13, 2012.

Ostrow, S.A., Lake, R.A., Lombardi, J.P., Coutu, Jr., R.A. and Starman, L.A., “Fabrication Process Comparison and Dynamics Evaluation of Electrothermal Actuators for a Prototype MEMS Safe and Arming Device,” Journal of Experimental Mechanics, Digital Object Identifier (DOI) 10.1007/s11340-011-9579-8, pp. 1-10, 2012.

#### **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.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Member, ION (Institute of Navigation) – organized Dayton Chapter tour of the Institute for Development and Commercialization of Advanced Sensor Technology (IDCAST) facilities; first-ever industry tour.

Member: AIAA – coordinated for judges for the presentation portion of the Dayton Aircraft Design and Handling Competition .

Member: IEEE, AOC (Association of Old Crows), TBP, and HKN.

#### **TEMPLE, MICHAEL A.,**

Professor of Electrical Engineering, Department of Electrical and Computer Engineering at the USAF Institute of Technology (AFIT). AFIT Appointment Date: 1996 (AFIT/ENG). BSE (1985) and MSE (1986), Southern Illinois University, Edwardsville IL. Ph.D., AFIT, 1993. Research interests include passive emitter identification, tracking and location using RF Distinct Native Attribute (RF-DNA) fingerprinting and complex waveform generation via Spectrally Modulated, Spectrally Encoded (SMSE) processing. Sponsored research efforts in Command, Control, Communications and Intelligence (C3I) and Electronic Warfare (EW), as adopted by and/or transitioned to agencies within the US Department of Defense, has provided over \$2M in R&D Technology benefit. Senior member of IEEE (January 2002). Tel. 937-255-3636 x4279 (DSN 785-3636 x4279), email: [Michael.Temple@afit.edu](mailto:Michael.Temple@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

“CR/SDR Based RFINT Technologies.” Sponsor: LTS. Funding: \$46,721. [CCR]

“RFINT for Commercial Communications.” Sponsor: AS&T. Funding: \$50,426. [CCR]

“Phase III Support: RF-EW Systems.” Sponsor: AFRL/RV. Funding: \$85,000. [CCR]

#### REFEREED JOURNAL PUBLICATIONS

Stone, Temple, “RF-Based Anomaly Detection for PLCs in Critical Infrastructure Apps,” *Int’l Jour on Critical Infrastructure Protection*, Vol. 5, No. 2, pp. TBD, To Appear Jul 2012. [CCR]

Cobb, Lapse, Baldwin, Temple, and Kim, “Intrinsic PHY-Layer Authentication of ICs,” *IEEE Trans Info Forensics & Security, Special Issue: IC & Sys Security*, Vol. 7, No. 1, Feb 2012, pp. 14-24. [CCR]

Harmer, Temple, Buckner, Farquhar, “4G Security Using Physical Layer RF-DNA with DE-Optimized LFS Classification,” *J. of Communications: Advances in Communications and Networking*, Vol. 6, No. 9, Dec 2011, pp. 671-681.

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

Kuciapinski, Temple, “(U) RFINT for Satellite Communications,” *2012 Nat’l SIGINT Development Conf*, Baltimore MD, Classified Proceedings, Jun 2012, pp. CP.RF1.1- CP.RF1.9, 20% Presentation Sel Rate. [CCR]

Reising, Temple, “WiMAX Mobile Subscriber Verification Using Gabor-Based RF-DNA Fingerprints,” *2012 Int’l Communications Conference (ICC12)*, Ottawa, Canada, Jun12, pp. CISS:08-41- CISS:08-48, 31% Presentation Sel Rate. [CCR]

Stone, Temple, “RF-Based Anomaly Detection for PLCs,” *6th Annual Int’l Conf on Critical Infrastructure Protection*, IFIP Working Group 11.10, Fort McNair, Washington D.C., Mar 2012, pp. VII1-VII8. [CCR]

Reising, Temple, and Oxley, “Gabor-Based RF-DNA Fingerprinting for Classifying 802.16e WiMAX Mobile Subscribers,” *Int’l Conf on Computing, Networking and Communications (ICNC12)*, Jan 2012, pp. S21-S28, 35% Presentation Sel Rate. [CCR]

Buckner, Bobrek, Farquhar, Harmer, and Temple, “Enhancing Network Security Using LFS and Fractional FT-Based RF Fingerprints,” *2011 SDR’11-Wireless Innovation Conf (WInnComm11)*, Dec 2011, pp. SDR11.1- SDR11.10.

Reising, Prentice, Temple, “An FPGA Implementation of Real-Time RF-DNA for RFINT Applications,” *2011 Military Communications Conf (MILCOM11)*, Baltimore, MD, Nov 2011, pp. MILU.11.S3.1-MILU.11. S3.8. [CCR]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Member, Multi-Agency SME Tech Panel: Nat’l Nuclear Security Administration, Office of Nonproliferation Rsrch and Engr (NSA/NA-22), Oak Ridge Nat’l Lab, Oakridge, TN.

**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](mailto:Andrew.Terzuoli@afit.edu)

**SPONSOR FUNDED RESEARCH PROJECTS**

“Remote Sensing and Communications for Advanced Technical Exploitation.” Sponsor: NASIC. Funding:  
\$120,000.

“Next Generation Radar Range (NGRR) – Outdoor.” Sponsor: AFRL/RV. Funding: \$100,000.

**REFEREED JOURNAL PUBLICATIONS**

N. A. Estep, J. C. Petrosky, J. W. McClory, Y. C. Kim, A. J. Terzuoli, Jr., “Electromagnetic Interference and  
Ionizing Radiation Effects on CMOS Devices,” IEEE Transactions on Plasma Science, Vol. 40, No. 6, June  
2012, pp 1495-1501.

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

A. Brueggen, L. Burchett, S. Hartzell, J. Pennington, J. Wilson, R. Martin, A. Terzuoli, A. Tubbs, E. Walton,  
“Aerostat Communication Design,” Proceedings of the 15th International Symposium of Antenna  
Technology and applied ElectroMagnetics (ANTEM 2012), Toulouse, FR, 25-28 June 2012.

L. Burchett, L. Fredette, J. Wilson, T-H. Lee, R. Marhefka, A. Terzuoli, A. Tubbs, “Spherical Antenna  
Design for Satellite Communications,” Proceedings of the 15th International Symposium of Antenna  
Technology and applied ElectroMagnetics (ANTEM 2012), Toulouse, FR, 25-28 June 2012.

K. Wallis, G. Akers, P. Collins, R. Davis, A. Frazier, M. Oxley, A. Terzuoli, “Complex Empirical Mode  
Decomposition, Hilbert-Huang Transform, and Fourier Transform Applied to Moving Objects,”  
Proceedings of the 2012 IEEE International Geoscience and Remote Sensing Symposium (IGARSS 2012),  
Munich, GE, 22-27 July 2012.

L. Burchett, S. Hartzell, G. Hoffar, J. Mautz, C. Taylor, A. Terzuoli, “Angle of Arrival Geolocation Using  
Nonlinear Optimization,” Proceedings of the 2012 IEEE International Geoscience and Remote Sensing  
Symposium (IGARSS 2012), Munich, GE, 22-27 July 2012.

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

J. Oliver, Wm. Bailey, M. Pochet, A. Terzuoli, “Timing in Magnetic Switches and Magnetic Pulse  
Compression,” Proceedings of the European Electromagnetics Symposium (EUROEM 2012), Toulouse,  
FR, 2-6 July 2012.

**OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES**

Chair for Local Chapter Joint IEEE Societies APS, MTT, GRS.

Member of AFIT-AFRL-NASIC passive radar working group (PCR WG).

Member of DOD Over the Horizon Radar working group (OTHR WG).

Member of WPAFB Reconnaissance Steering Group (RSG).

Steering committee Member Joint AFIT-AFRL-NASIC Wright Patt MASINT Development Consortium (WPMDC).

Participant in Dayton Development Coalition (DDC) Sensors Task Force.

Participant in DDC Science, Technology, Engineering, and Math (STEM) Education Summit.

**WOOLLEY, BRIAN G., Capt,**

Assistant Professor of Computer Science, Department of Electrical and Computer Engineering, AFIT  
Appointment Date: 2012 (AFIT/ENG); BS, Computer Engineering, California State University, Sacramento, 2002; MS Computer Engineering, Air Force Institute of Technology, 2007; PhD, Computer Engineering, University of Central Florida, 2012. His research interests include artificial intelligence for autonomous vehicles, evolutionary computation of control behaviors, and sensor fusion via computer vision techniques for world modeling. Tel. 937-255-3636 x4618 (DSN 785-3636 x618), email: [Brian.Woolley@afit.edu](mailto:Brian.Woolley@afit.edu)

### **5.3. DEPARTMENT OF ENGINEERING PHYSICS**

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Homepage: <http://www.afil.edu/en/enp/>

<b>5.3.1</b>	<b><u><a href="#">DOCTORAL DISSERTATIONS</a></u></b>	<b>121</b>
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<b>5.3.3</b>	<b><u><a href="#">FACULTY BIOGRAPHIES &amp; RESEARCH OUTPUT</a></u></b>	<b>123</b>

### 5.3.1. DOCTORAL DISSERTATIONS

BROWN, KIRK C., *Collisional Dynamics, Lasing and Simulated Raman Scattering in Optically Pumped Cesium and Potassium Vapors*. AFIT/DS/ENP/12-M01. Faculty Advisor: Dr. Glen P. Perram. Sponsor: HELJTO. [CDE]

LANGE, MATTHEW A., *Kinetics of the Electrical Discharge Pumped Oxygen-Iodine Laser*. AFIT/DS/ENP/11-S07. Faculty Advisor: Dr. Glen P. Perram. Sponsor: AFOSR. [CDE]

SHEELY, EUGENE V., *Theoretical Study of the Effects of Di-Muonic Molecules on Muon-Catalyzed Fusion*. AFIT/DS/ENP/12-M02. Faculty Advisor: Dr. Larry W. Burggraf. Sponsor: N/A.

STEWART, BRYAN J., *Characterization and Discrimination of Large Caliber Gun Blast and Flash Signatures*. AFIT/DS/ENP/11-D01. Faculty Advisor: Dr. Glen P. Perram. Sponsor: NASIC. [CTISR]

### 5.3.2. MASTER'S THESES

BENSON, MICHAEL R., *Characterization and Measurements from the Infrared Grazing Angle Reflectometer*. AFIT/OSE/ENP/12-J01. Faculty Advisor: Dr. Michael A. Marciniak. Sponsor: N/A. [CDE]

BURCHETT, LEE R., *Turbulence Measurement in the Atmospheric Boundary Layer Using Cellular Telephone Signals*. AFIT/APPLPHY/ENP/12-M01. Faculty Advisor: Dr. Steven T. Fiorino. Sponsor: HELJTO. [CDE]

BURLEY, JARRED L., *Comparison of High Energy Laser Expected Dwell Times and Probability of Kill for Mission Planning Scenarios in Actual and Standard Atmosphere*. AFIT/APPLPHY/ENP/12-M02. Faculty Advisor: Dr. Steven T. Fiorino. Sponsor: HELJTO. [CDE]

EKHOLM, JARED M., *3-D Scene Reconstruction from Aerial Imagery*. AFIT/APPLPHY/ENP/12-M03. Faculty Advisor: Lt Col Karl C. Walli. Sponsor: AFRL/RV. [CTISR]

EMMONS, DANIEL J., *Ensemble Forecasting of Coronal Mass Ejections Using the WSA-ENLIL with Coned Model*. AFIT/APPLPHY/ENP/12-M04. Faculty Advisor: Lt Col Ariel O. Acebal. Sponsor: NASA.

FERREL, SIMON S., *Matrix Determination of Reflectivity of Hidden Objects via Indirect Photography*. AFIT/APPLPHY/ENP/12-M05. Faculty Advisor: Dr. Michael A. Marciniak. Sponsor: N/A. [CDE]

FITZGERALD, JACK G., *A Programmable Liquid Collimator for Both Coded Aperture Adaptive Imaging and Multiplexed Compton Scatter Tomography*. AFIT/NUCL/ENP/12-M01. Faculty Advisor: Dr. Larry W. Burggraf. Sponsor: USSTRATCOM.

GEARHART, JOEL S., *Investigation of BCF-12 Plastic Scintillating Coherent Fiber Bundle Timing Properties*. AFIT/NUCL/ENP/12-M02. Faculty Advisor: Maj Benjamin R. Kowash. Sponsor: DHS.

HAMILTON, MERLE D., *Electrical and Optical Characterizations of Si-Ge-Sn*. AFIT/APPLPHY/ENP/12-M06. Faculty Advisor: Dr. Yung Kee Yeo. Sponsor: AFOSR.

HIGGINS, DANIEL J., *Positron Lifetime Modulation by Electric Field Induced Positronium Formation on a Gold Surface*. AFIT/NUCL/ENP/12-M03. Faculty Advisor: Dr. Larry W. Burggraf. Sponsor: AFOSR.

JIMENEZ, STEPHEN M., *Design and Characterization of a Three-Dimensional Positron Annihilation Spectroscopy System Using a Low-Energy Positron Beam*. AFIT/NUCL/ENP/12-M04. Faculty Advisor: Dr. Larry W. Burggraf. Sponsor: AFOSR.

LANE, CORY T., *Comparative Statistical Analysis of Auroral Models*. AFIT/APPLPHY/ENP/12-M07.  
Faculty Advisor: Lt Col Ariel O. Acebal. Sponsor: NASA.

LOTT, GORDON E., *Cesium Absorption Spectrum Perturbed by Argon: Observation of Non-Lorentzian Far Wings*. AFIT/APPLPHY/ENP/12-M08. Faculty Advisor: Dr. Glen P. Perram. Sponsor: HELJTO. [CDE]

LU, QUAN-HAI T., *Durability of MWCNT Composites Under Electron and Neutron Irradiation*. AFIT/NUCL/ENP/12-M05. Faculty Advisor: Dr. John W. McClory. Sponsor: AFRL/RX.

MACE, MELANIE E., *Calibration of a Silver Detector Using a PuBe Source*. AFIT/NUCL/ENP/12-J01.  
Faculty Advisor: Dr. John W. McClory. Sponsor: AFRL/RD.

MCCONNELL, SHANE N., *Spectral and Spatial Coherent Emission of Thermal Radiation from Metal-Semiconductor Nanostructures*. AFIT/EE.ABET/ENP/12-M01. Faculty Advisor:  
Dr. Michael A. Marciniak. Sponsor: N/A. [CDE]

MCQUARY, THOMAS P., *Neutron Detection Using Amorphous Boron-Carbide Hetero-Junction Diodes*. AFIT/NUCL/ENP/12-M06. Faculty Advisor: Dr. John W. McClory. Sponsor: DTRA.

RHOBY, MICHAEL R., *Application of an Imaging Fourier-Transform Spectrometer for the Means of Combustion Diagnostics*. AFIT/OSE/ENP/12-J02. Faculty Advisor: Dr. Kevin C. Gross. Sponsor: Spectral Sciences, Inc.

ROTH, BENJAMIN D., *LADAR Performance Simulations with a High Spectral Resolution Atmospheric Transmittance and Radiance Model-LEEDR*. AFIT/APPLPHY/ENP/12-M09. Faculty Advisor:  
Dr. Steven T. Fiorino. Sponsor: AFRL/RX. [CDE]

SCHAFER, JESSICA M., *The Focusing of Light Scattered from Diffuse Reflectors Using Phase Modulation*. AFIT/APPLPHY/ENP/12-M10. Faculty Advisor: Dr. Michael A. Marciniak. Sponsor: AFOSR. [CDE]

SCHOFIELD, JOSEPH C., *Mapping Nuclear Fallout Using the Weather Research and Forecasting (WRF) Model*. AFIT/CWMD/ENP/12-S01. Faculty Advisor: Dr. Steven T. Fiorino. Sponsor: HELJTO. [CDE]

SELLERS, SPENCER R., *FDTD Simulation of Novel Polarimetric and Directional Reflectance and Transmittance Measurements from Optical Nano- and Micro-Structured Materials*. AFIT/EE.ABET/ENP/12-M02. Faculty Advisor: Dr. Michael A. Marciniak. Sponsor: N/A. [CDE]

SISEK, AARON J., *Radar Return Degradation of Aircraft Paint from a Nuclear Weapon Thermal Pulse*. AFIT/NUCL/ENP/12-M07. Faculty Advisor: Dr. James C. Petrosky. Sponsor: AFNWC.

SU'E, CHAD B., *Characterization of a Hyperspectral Chromotomographic Imaging Ground System*. AFIT/EE.ABET/ENP/12-M03. Faculty Advisor: Lt Col Michael R. Hawks. Sponsor: N/A. [CTISR]

WITTMAN, THOMAS M., *A Quantitative Analysis of Solar Flare Characteristics as Observed in the Solar Observing Optical Network and the Global Oscillation Network Group*. AFIT/APPLPHY/ENP/12-M11.  
Faculty Advisor: Lt Col Ariel O. Acebal. Sponsor: AFRL/RV.



### 5.3.3. FACULTY BIOGRAPHIES & RESEARCH OUTPUT

Notes: Research Center affiliations are listed in [ ] if applicable. Shared credit for funding awards is indicated by the percentages shown for each faculty member associated with the project.

#### **ACEBAL, ARIEL O., Lt Col,**

Assistant Professor of Atmospheric Physics, Department of Engineering Physics, AFIT Appointment Date: 2008 (AFIT/ENP); BS, Florida State University, 1993; MS, Air Force Institute of Technology, 2000; PhD, Utah State University, 2008. Lt Col Acebal's research interests cover a range of topics under the broad umbrella of space physics. Recent work has focused primarily on solar radio emissions with an emphasis on correlations with solar EUV emissions and ionospheric models. He is also interested in the transition of cutting-edge research to operational forecast products. Previously, he worked as the commander of the Palehua Solar Observatory and the branch chief for the Space Weather Branch at the Air Force Weather Agency. He is a member of the American Geophysical Union. Tel. 937-255-3636 x4518 (DSN 785-3636 x4518), email: [Ariel.Acebal@afit.edu](mailto:Ariel.Acebal@afit.edu)

#### REFEREED JOURNAL PUBLICATIONS

MacNeice, P., B. Elliott, and A. Acebal (2011), "Validation of community models: 3. Tracing field lines in heliospheric models," *Space Weather: The International Journal of Research and Applications* 9, S10003, DOI:10.1029/2011SW000665.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Invited talk, Acebal, A. "CCMA-AFIT Model Validation Projects," 6th CCMC Community Workshop, Key Largo, FL, January 2012.

Invited talk, Acebal, A., "CCMC in University Education," 6th CCMC Community Workshop, Key Largo, FL, January 2012 JTO BAA, 1 Oct 10 – 30 Sep 11.

Established new track of Atmospheric and Space Sciences within the Applied Physics MS degree program, at the request of the Director of Weather.

Member, DOD Space Weather Requirements Working Group.

Member, USAF Scintillation Working Group.

Member, DOD Space Weather Integrated Product Team.

#### **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](mailto:William.Bailey@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

"Thermochemical Modeling in Hypersonic Flow." Sponsor: AFRL/RB. Funding: \$34,760. [CDE]

#### REFEREED JOURNAL PUBLICATIONS

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

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

J.W. Englert, J.C. Petrosky, W.F. Bailey, J.W. McClory, A. Heger, L. Tauxe, D.R. Watts, "Estimating Peak EMP Magnetic Fields Using Alternating Field Demagnetization," *Hardened Electronics and Radiation Technology Conference 2012*, Proceedings Paper No. PE.4, Monterey, CA, March 2012.

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

Josyula, E., Burt, J., Bailey, W., Vedula, P., "Influence of Thermochemical Nonequilibrium on Transport Properties for Hypersonic Flow Simulations," Proceedings of the 43<sup>rd</sup> AIAA Thermophysics Conference, 25-28 June 2012, New Orleans, Louisiana.

#### **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 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. Dr. Bickley resigned from AFIT in July 2012 and has taken a civilian position at Patrick AFB.

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

M.R. Halstead, S. Lee, J.C. Petrosky, A.A. Bickley, P. Sokol, "Neutron energy spectrum characterization on TMR-1 at the Indiana University neutron source," *Physics Procedia*, 26, 188-195 (2012), proceedings paper of the Union of Compact Accelerator-Driven Neutron Sources Conference, Bloomington, Indiana, 2011.

A.A. Bickley, M.R. Halstead, J. W. McClory, S. Lee, P. Sokol, J.C. Petrosky, "Evaluation of the Neutron Energy Spectrum Produced at the Neutron Radiation Effects Beam Line Utilizing a Computational Monte Carlo Approach," *Hardened Electronics and Radiation Technology Conference 2012*, Proceedings Paper No. PI.2, Monterey, CA, March 2012.

M.E. Mace, J.W. McClory, B.R. Kowash, A.A. Bickley, "Calibration of a Pulsed Neutron Source Detector System," *Hardened Electronics and Radiation Technology Conference 2012*, Proceedings Paper No. I.5, Monterey, CA, March 2012.

B.J. Singleton, B. S. Jones, J. C. Petrosky, A. A. Bickley, B.R. Kowash, and J.W. McClory, "Radiation Effects on YAG:Ce Scintillating Fiber," *Hardened Electronics and Radiation Technology Conference 2012*, Proceedings Paper No. D.4, Monterey, CA, March 2012.

**BOREL-DONOHUE, CHRISTOPH C.,**

Research Associate Professor, Department of Engineering Physics, AFIT Appointment Date: 2010 (AFIT/ENP); Dipl. El. 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 and the American Geophysical Union. Tel. 937-255-3636 x4957 (DSN 785-3636 x4957), email: [Christoph.Borel@afit.edu](mailto:Christoph.Borel@afit.edu)

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

Christoph Borel, Dalton Rosario, Joao Romano, "Range-invariant anomaly detection applied to imaging Fourier Transform Spectrometry data," Proceedings of the 2012 Optical Engineering+Applications SPIE Optics+Photonics, 14-16 August 2012, San Diego, CA. Conference: Imaging Spectrometry XVII (Shen/Lewis), Vol. 8515, paper 85150J-1. [CTISR]

Christoph C. Borel, David J. Bunker, "Multispectral Vegetative Canopy Parameter Retrieval," Proceedings of the SPIE Vol. 8174, 4 Oct 2011, Remote Sensing for Agriculture, Ecosystems, and Hydrology XIII Conference (Neale/Maltese), paper 81740T-1. [CTISR]

**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](mailto:Charles.Bridgman@afit.edu)

**BUNKER, DAVID J.,**

Director, Center for Technical Intelligence Studies and Research, and Research Assistant Professor of Engineering Physics, Department of Engineering Physics, AFIT Appointment Date: 2010 (AFIT/ENP); BS, Aerospace Engineering, Pennsylvania State University, 1984; MS, Mechanical Engineering, University of Dayton, 1988; PhD, Aerospace Engineering Sciences, University of Colorado, 1994. Dr Bunker's research interests include applications of measurement and signature technology, remote sensing, and technical intelligence. Additional interests include high angle of attack and vertical flow structures, unsteady fluid dynamics, experimental wind tunnel testing, and low-speed fluid mechanics. Tel. 937-255-3636 x4547 (DSN 785-3636 x4547), email: [David.Bunker@afit.edu](mailto:David.Bunker@afit.edu)

**SPONSOR FUNDED RESEARCH PROJECTS**

"Rapid Location of Radiation Sources in Complex Environments Using Optical and Radiation Sensors." Sponsor: DTRA. Funding: \$381,998 – Bunker 25%, Borel-Donohue 50%, Magnus 15%, Tuttle 10%. [CTISR]

“Intelligence, Surveillance and Reconnaissance Research Program.” Sponsor: SAIC. Funding: \$20,000 – Bunker 10%, Borel-Donohue 90%. [CTISR]

“Overhead Persistent Infra-Red R&D.” Sponsor: NGA. Funding: \$454,000 – Bunker 50%, Borel-Donohue 40%, Tuttle 5%, Walli 5%. [CTISR]

“Gait Signature Research.” Sponsor: NRL. Funding: \$115,000 – Bunker 35%, Borel-Donohue 40%, Tuttle 20%, Walli 5%. [CTISR]

“Trajectory Prediction Code Assessment.” Sponsor: NASIC. Funding: \$14,840 – Bunker 80%, Tuttle 20%. [CTISR]

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

Christoph C. Borel, David J. Bunker, “Multispectral Vegetative Canopy Parameter Retrieval,” Proceedings of the SPIE Vol. 8174, 4 Oct 2011, Remote Sensing for Agriculture, Ecosystems, and Hydrology XIII Conference (Neale/Maltese), paper 81740T-1. [CTISR]

#### **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, 1993. Dr. Burggraf conducts experimental and theoretical research in materials chemistry including biomaterials, nuclear chemistry, exotic-atom chemistry, positron spectroscopy, surface spectroscopy, atomic force microscopy, gamma spectroscopy and radiation imaging to solve DOD, DHS and DOE problems in WMD non-proliferation. Theoretical research to model surfaces, clusters and exotic-atom molecules applies quantum mechanics modeling to interpret experimental results. Dr. Burggraf is author for more than 45 refereed archival publications. Tel. 937-255-3636 x4507 (DSN 785-3636 x4507), email: [Larry.Burggraf@afit.edu](mailto:Larry.Burggraf@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

“Chemical Explosive Dynamics and Effects on Bacillus Anthracis.” Sponsor: DTRA. Funding: \$219,195.

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

Hannah E. Hocking, Larry W. Burggraf, Xiaofeng F. Duan, Joseph A. Gardella Jr., Brett P. Yatzor, Wesley A. Schuler; “Composition of uranium oxide particles related to TOF-SIMS ion distributions,” Surface and Interface Analysis (John Wiley & Sons), SIMS proceedings paper issue (5 Aug 2012, DOI: 10.1002/sia.5114).

#### **CUSUMANO, SALVATORE J.,**

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.

#### SPONSOR FUNDED RESEARCH PROJECTS

“Tactical High Energy Laser Weapon Alignment System Architecture Efficiencies.” Sponsor: HELJTO. Funding: \$174,239. [CDE]

“Airborne Aero-Optic Laboratory.” Sponsor: AFRL/RD. Funding: \$114,650. [CDE]

“Compensation of Aero-Optical and Atmospheric Disturbances via Coherence Phasing Loops of a Fiber Laser Array.” Sponsor: AFOSR. Funding: \$75,000 – Cusumano 51%, Fiorino 49%. [CDE]

“Wave Optics Modeling and Simulation for NPS and Laser Target Interaction Study.” Sponsor: NPS. Funding: \$62,500 – Cusumano 40%, Hyde 30%, Marciniak 15%, Fiorino 15%. [CDE]

#### SPONSOR FUNDED EDUCATIONAL PROJECTS

“High Energy Laser Weapons Systems Short Course Continued Development and Delivery.” Sponsor: AFRL/RD. Funding: \$19,380 – Cusumano 55%, Fiorino 45%. [CDE]

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

Burley, J.L., S.T. Fiorino, R.M. Randall, R.J. Bartell, and S.J. Cusumano, “High energy laser tactical decision aid (HELTDA) for mission planning and predictive avoidance,” (Proc. of SPIE Vol. 8381 83811L-14) SPIE Defense, Security and Sensing Symposium, Baltimore, MD, 23-26 April 2012. [CDE]

Basu S., S.J. Cusumano, M.W. Hyde, M.A. Marciniak, and S.T. Fiorino, “Validity of using Gaussian Schell model for extended beacon studies,” (Proc. of SPIE Vol. 8380 83800E-1) SPIE Defense, Security and Sensing Symposium, Baltimore, MD, 23-26 April 2012. [CDE]

#### **FIORINO, STEVEN T.,**

Director, Center for Directed Energy, and 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, the Directed Energy Professional Society, Society of Photo-Instrumentation Engineers (SPIE), and additionally holds a Master of Military Operational Art and Science from Air University (2003). Tel. 937-255-3636 x4506 (DSN 785-3636 x4506), email: [Steven.Fiorino@afit.edu](mailto:Steven.Fiorino@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

“CY2012 HELJTO M&S TAWG Product Development.” Sponsor: HELJTO. Funding: \$625,000 – Fiorino 51%, Cusumano 47%, Gross 1%, Hawks 1%. [CDE]

“Modification of AFIT Atmospheric Effects Software Code for AFRL/RD.” Sponsor: AFRL/RD. Funding: \$108,136 – Fiorino 45%, Cusumano 45%, Randall 10%. [CDE]

“High Energy Laser-Joint Technology Office Contracting Officer Technical Representative.” Sponsor: HELJTO. Funding: \$6,864. [CDE]

“2012 AFIT Center for Directed Energy Summer Intern (DESI) Program.” Sponsor: HELJTO. Funding: \$50,000 – Fiorino 55%, Cusumano 45%. [CDE]

“Airborne Aero-Optics Lab Beam Control Collection and Evaluation.” Sponsor: HELJTO. Funding: \$51,280 – Fiorino 45%, Cusumano 55%. [CDE]

#### REFEREED JOURNAL PUBLICATIONS

Fiorino, S.T., J.A. Deibel, P.M. Grice, M.H. Novak, J. Spinoza, L. Owens, S. Ganti, "A Technique to Measure Optical Properties of Brownout Clouds for Modeling Terahertz Propagation," *Applied Optics*, Vol. 51, Iss. 16, pp. 3605–3613 (2012). [CDE]

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

Fiorino, S.T., S.M. Shirey, M.F. Via, D.J. Grahm, and M.J. Krizo, "Potential Impacts of Elevated Aerosol Layers on High Energy Laser Aerial Defense Engagements," (Proc. of SPIE Vol. 8380 83800T-1) SPIE Defense, Security and Sensing Symposium, Baltimore, MD, 23-26 April 2012. [CDE]

Beauchamp, R.L. and S.T. Fiorino, "Propagation of laser light through aero-optic flow: dry air at 0.4 Mach with three-dimensional turret," (Proc. of SPIE Vol. 8380 83800M-1) SPIE Defense, Security and Sensing Symposium, Baltimore, MD, 23-26 April 2012. [CDE]

Roth, B.D. and S.T. Fiorino, "LADAR Performance Simulations with a High Spectral Resolution Atmospheric Transmittance and Radiance Model - LEEDR," (Proc. of SPIE Vol. 8379 83790O-15) SPIE Defense, Security and Sensing Symposium, Baltimore, MD, 23-26 April 2012. [CDE]

Burley, J.L., S.T. Fiorino, R.M. Randall, R.J. Bartell, and S.J. Cusumano, "High energy laser tactical decision aid (HELTDA) for mission planning and predictive avoidance," (Proc. of SPIE Vol. 8381 83811L-14) SPIE Defense, Security and Sensing Symposium, Baltimore, MD, 23-26 April 2012. [CDE]

Burchett, L.R., S.T. Fiorino, and M. Buchanan, "Automation of  $C_n^2$  Profile Extraction from Weather Radar Images," (Proc. of SPIE Vol. 8380 83800I-1) SPIE Defense, Security and Sensing Symposium, Baltimore, MD, 23-26 April 2012. [CDE]

Basu S., S.J. Cusumano, M.W. Hyde, M.A. Marciniak, and S.T. Fiorino, "Validity of using Gaussian Schell model for extended beacon studies," (Proc. of SPIE Vol. 8380 83800E-1) SPIE Defense, Security and Sensing Symposium, Baltimore, MD, 23-26 April 2012. [CDE]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Chair, HEL-JTO Modeling and Simulation Technical Area Working Group (MS TAWG), 1 Dec 11–30 Sep 12.

Contracting Officer Representative for the Analytic Model for the Adaptive Optical Compensation for Thermal Blooming (AOTB) HEL-JTO BAA.

Invited talk, Climate Change presentation for the Honors Society of Metropolitan Dayton, 28 Feb 12.

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

Assistant Professor of Physics, Department of Engineering Physics, AFIT Appointment Date: 2012 (AFIT/ENP); BS, United States Air Force Academy, 1992; MS, Air Force Institute of Technology, 1997; PhD, University of Maryland, 2007. Lt Col Franz's research focuses on lasers and optics. His current interests are investigating the nonlinear dynamics of fiber lasers for coherent beam combining and using laser pulses to produce x-rays for material characterization. Before joining AFIT, he was a physics faculty member at the Air Force Academy for 8 years and deployed to Iraq and Afghanistan. He has also worked in nuclear treaty monitoring and infrared missile engagement modeling and simulation. Member of the American Association of Physics Teachers and the American Physical Society. Tel. 937-255-3636 X4429 (DSN 785-3636 x4429), email: [Anthony.Franz@afit.edu](mailto:Anthony.Franz@afit.edu)

#### **GARVIN, MATTHEW B., Capt,**

Assistant Professor of Physics, Department of Engineering Physics, AFIT Appointment Date: 2011 (AFIT/ENP); BS, Brigham Young University, 1999; MS, Brigham Young University, 2001; MS, University

of Virginia, 2003; PhD, Air Force Institute of Technology, 2009. Capt Garvin's recent work has focused on employing time-dependent methods for solving Schrödinger's equation for non-adiabatic systems. Previously, he worked in the Air Force Research Laboratory's Directed Energy and Space Vehicles directorates as a scientist and project manager. He holds one patent. Tel. 937-255-3636x4693 (DSN 785-3636x4828), email: [Matthew.Garvin@afit.edu](mailto:Matthew.Garvin@afit.edu)

#### **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 169 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, CdWO<sub>4</sub>) for improved detection of nuclear radiation, wide band-gap semiconductors for photorefractive applications, 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](mailto:Nancy.Giles@afit.edu)

#### **SPONSOR FUNDED RESEARCH PROJECTS**

"Transition-Metal-Ion Doped II-VI Semiconductors." Sponsor: AFRL/RV. Funding: \$28,152.

#### **REFEREED JOURNAL PUBLICATIONS**

J.D. Rowley, J.K. Wahlstrand, K.T. Zawilski, P.G. Schunemann, N.C. Giles, and A.D. Bristow, "Terahertz generation by optical rectification in uniaxial birefringent crystals," *Optics Express* Vol. 20, No. 15, pp. 16968-16973 (July 2012).

J.D. Rowley, J.K. Pierce, A.T. Brant, L.E. Halliburton, N.C. Giles, P.G. Schunemann, and A.D. Bristow, "Broadband terahertz pulse emission from ZnGeP<sub>2</sub>," *Optics Letters* Vol. 37, pp. 788-790 (March 2012).

#### **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](mailto:Kevin.Gross@afit.edu)

#### **SPONSOR FUNDED RESEARCH PROJECTS**

"NASIC Ground Truth Support." Sponsor: NASIC. Funding: \$149,985. [CTISR]

"Polarimetric HIS for Improved Radioactive Source Detection Sensitivity and Localization Accuracy." Sponsor: DTRA. Funding: \$354,933.

#### **REFEREED JOURNAL PUBLICATIONS**

Bryan J. Steward, Glen P. Perram, Kevin C. Gross, "Modeling Midwave Infrared Muzzle Flash Spectra from Unsuppressed and Flash-Suppressed Large Caliber Munitions," *Infrared Physics & Technology*, Vol. 55, No. 4, pp. 246-255 (2012). <http://dx.doi.org/10.1016/j.infrared.2012.04.005> ( July 2012). [CTISR]

Kevin C. Gross, Christopher M. Hadad, Paul G. Seybold, "Charge Competition in Halogenated Hydrocarbons," *International Journal of Quantum Chemistry*, Vol. 112, No. 1, pp. 219–229 (2012). <http://dx.doi.org/10.1002/qua.23223> ( Jan 2012).

Bryan J. Steward, Glen P. Perram, Kevin C. Gross, "Visible and Near-Infrared Spectra of the Secondary Combustion of a 152 mm Howitzer," *Applied Spectroscopy*, Vol. 65, No. 12, pp. 1363–1371 (2011). <http://dx.doi.org/10.1366/11-06445>. (Dec 2011). [CTISR]

Bryan J. Steward, Kevin C. Gross, Glen P. Perram, "Optical Characterization of Large Caliber Muzzle Blast Waves," *Propellants, Explosives, and Pyrotechnics*, Vol. 36, No. 6, pp. 564–575 (2011). <http://dx.doi.org/10.1002/prep.201100037> (Dec 2011). [CTISR]

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

Jacob L. Harley, Charles F. Wisniewski, August J. Rolling, and Kevin C. Gross, "Spatially-Resolved Infrared Spectra of Jet Exhaust from an F109 Turbofan Engine," *Proc. of the SPIE*, Vol. 8354, pp. 83540H (2012). <http://link.aip.org/link/doi/10.1117/12.920630>. SPIE Defense, Security, and Sensing, Baltimore, MD, 23–27 April 2012. [CTISR]

Michael R. Rhoby, Kevin C. Gross, "Mid-wave IFTS measurements of a laboratory-scale laminar flame," *Proc. of the SPIE*, Vol. 8390, pp. 83900E (2012). <http://dx.doi.org/10.1117/12.920651>. SPIE Defense, Security, and Sensing, Baltimore, MD, 23–27 April 2012.

Bryan J. Steward, Kevin C. Gross, and Glen P. Perram, "Characterization and discrimination of large caliber gun blast and flash signatures," *Proc. of the SPIE*, Vol. 8360, pp. 836006 (2012). <http://dx.doi.org/10.1117/12.920583>. SPIE Defense, Security, and Sensing, Baltimore, MD, 23–27 April 2012. [CTISR]

Michael R. Rhoby, Kevin C. Gross, David L. Blunck, "Application of an Imaging Fourier-Transform Spectrometer to Determine Two-Dimensional Scalar Values in Laminar Flames," *Proceedings of the Combustion Institute. 2012 Central States Section Spring Technical Meeting*, Dayton, OH, 22–24 April 2012.

Roberto I. Acosta, Kevin C. Gross, Glen P. Perram, "Mid-Infrared Imaging Fourier Transform Spectrometry for High Power Fiber Laser Irradiated Fiberglass Composites," *Proc. of the SPIE* 8239, 8239R (2012); <http://dx.doi.org/10.1117/12.906434>. SPIE Photonics West, San Francisco, CA, 21–26 January 2012. (Invited paper.) [CDE]

#### **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.

#### **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](mailto:Michael.Hawks@afit.edu)

#### **SPONSOR FUNDED RESEARCH PROJECTS**

“Sensor Development for Monocular Passive Ranging (MOPAR).” Sponsor: NASIC. Funding: \$180,000. [CTISR]

#### **HENGEGHOLD, 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](mailto:Robert.Hengehold@afit.edu)

#### **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 conducted classified research with space-based nuclear detonation detection sensors in collaboration with the Los Alamos National Laboratory. Dr. Holtgrave currently holds a position of tenure-track Assistant Professor of Physics at Central State University (Ohio).

#### **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](mailto:Benjamin.Kowash@afit.edu)

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

B.J. Singleton, B.S. Jones, J.C. Petrosky, A.A. Bickley, B.R. Kowash, and J.W. McClory, "Radiation Effects on YAG:Ce Scintillating Fiber," *Hardened Electronics and Radiation Technology Conference 2012*, Proceedings Paper No. D.4, Monterey, CA, March 2012.

#### **LEWIS, DOUGLAS R., LTC**

Assistant Professor of Biodefense Science, Department of Engineering Physics, AFIT, Appointment Date: 2012; BS, USAF Academy 1991, MS Pennsylvania State University 1995, PhD George Mason University 2012. LTC Lewis' previous research focused on genetic components of the insect immune system, genetic response to laser induced damage, peptide capture of biological agents, genetic identification of smallpox, and the organizational factors which have influenced the development of the US Biodefense program. Before joining AFIT, he served 16 years in the US Air Force and 5 years in the US Army to include assignments as an aircraft maintenance officer and as an Assistant Professor of Biology at the Air Force Academy. He also served in counter-WMD positions with the Defense Intelligence Agency (DIA), Air Staff, as an US/UK exchange scientist and with the Defense Threat Reduction Agency (DTRA). Proposed areas of future research include bacterial genetic response to thermal inactivation, grapheme based biological or chemical detection and characterization of bacterial genetic signatures associated with exposure to chemical weapons. Tel. 937-255-3636 x4569 (DSN 785-3636 x4569), email: [Douglas.Lewis@afit.edu](mailto:Douglas.Lewis@afit.edu)

#### **LI, ALEX G.,**

Research Assistant Professor, Department of Engineering Physics, AFIT Appointment Date: 1995 (Research Associate), 2008 (Research Faculty); BS, Changchun University of Science and Technology, 1982; PhD, Shanghai Institute of Optics and Fine Mechanics, Chinese Academy of Sciences, 1990. Dr. Li has over 20 years of research experience using AFM, SEM, FTIR, Raman, photoluminescence, EPR, ESCA, and XRD to characterize glass, ceramics, semiconductors, polymers, nano-carbon composites, and biological materials. He has published, mostly as the lead author, over two dozen peer-reviewed journal articles, including one top-ten download article of the Institute of Physics (IOP). He also conducted computer modeling of thermal transport and thermal stress in polymers, composites, and other advanced multifunctional materials. Dr. Li invented a novel AFM nano-patterning technique for producing sub-100 nm two-dimensional nanostructures in polymers, and held one patent for a proton conductor material. He was a post-doctoral fellow at Nagoya Institute of Technology and Aichi Institute of Technology prior to working for AFIT in 1995. Dr. Li had taught two core courses, Materials Characterization (MATL 680) and Materials Selection and Processing (MATL 685), for the AFIT materials science program. His current research includes experiment and computer modeling of thermal, mechanical, and electrical properties of granular systems, memristive devices and systems, biomaterials, ceramic matrix composites (CMC), and polymer matrix composites ceramic (PMC). Tel. 937-255-3636 x4576 (DSN 785-3636 x4576), email: [Alex.Li@afit.edu](mailto:Alex.Li@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

"Thermal and Mechanical Characterization of Multilayer Thermal Protection Materials." Sponsor: AFRL/RX. Funding: \$27,303.

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

Zheng Fan, Xudong Fan, Alex Li, and Lixin Dong, "Resistive Switching in Copper Oxide Nanowire-based Memristor," Proceedings of IEEE NANO 2012 Conference, Birmingham, UK, August 20-23, 2012. (ISSN: 1944-9399, Print ISBN: 978-1-4673-2198-3, DOI : 10.1109/NANO.2012.6322196).

#### **MAGNUS, AMY L.,**

Research Assistant Professor, 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. Dr. Magnus has published 11 articles and is writing a book on machine intelligence. She is a retired Major, USAF. Tel. 937-255-3636 x4555 (DSN 785-3636 x4555), email: [Amy.Magnus@afit.edu](mailto:Amy.Magnus@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

“Query Driven Learning Environments.” Sponsor: AFOSR. Funding: \$50,000.

“Investigation of Glass Materials for Pulsed Power Capacitors.” Sponsor: AFRL/RX. Funding: \$11,000.

#### **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](mailto:Michael.Marciniak@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

“Dynamic Data-Driven BRDF Measurement System.” Sponsor: AFRL/RX. Funding: \$170,000. [CDE]

“Indirect Photography.” Sponsor: AFOSR. Funding: \$49,155. [CDE]

“RF/Optical/Thermal Metamaterials Research.” Sponsor: AFRL/RX. Funding: \$30,000.

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

A.N. Volkov, L.V. Zhigilei, Michael A. Marciniak and Glen P. Perram, “Computational study of the role of oxidation in CW laser ablation of an aluminum target in a shear gas flow,” Proceedings of the 11<sup>th</sup> International Conference on Laser Ablation, (2011). [CDE]

Jason C. Vap, Stephen E. Nauyoks and Michael A. Marciniak, “Optimization of a mid-wave tunable polarimetric optical scatter instrument,” Proceedings of the SPIE **8364**, 8364-5 (2012). [CDE]

Jason C. Vap and Michael A. Marciniak, “Examining epsilon near zero structures through effective medium theory and optical thin-film analysis,” Proceedings of the SPIE **8364**, 8364-26 (2012). [CDE]

Santasri Basu, Salvatore J. Cusumano, Milo W. Hyde, Michael A. Marciniak, and Steven T. Fiorino, “Validity of using Gaussian Schell model for extended beacon studies,” Proceedings of the SPIE **8380**, 8380-13 (2012). [CDE]

Shane N. McConnell, Michael D. Seal, Stephen E. Nauyoks, Neil R. Murphy, Lirong Sun and Michael A. Marciniak, “Spectral coherent emission of thermal radiation in the far-field from a truncated resonator,” Proceedings of the SPIE **8457**, 8457-115 (2012). [CDE]

Spencer R. Sellers, Jason C. Vap, Stephen E. Nauyoks, Michael A. Marciniak and Zahun Ku, “Investigation of surface plasmonic extraordinary transmission for spectral, polarimetric, and off-normal incidence,” Proceedings of the SPIE **8457**, 8457-130 (2012). [CDE]

Jessica M. Schafer and M.A. Marciniak, “The focusing of light scattered from diffuse reflectors using phase modulation,” Proceedings of the SPIE **8495**, 8495-24 (2012). [CDE]

Simon S. Ferrel and M.A. Marciniak, "Matrix determination of hidden object reflectance by indirect photography," Proceedings of the SPIE **8495**, 8495-27 (2012). [CDE]

Michael R. Benson, Michael A. Marciniak and Jeffrey W. Burks, "Measuring grazing-angle DHR with the Infrared Grazing Angle Reflectometer," Proceedings of the SPIE **8495**, 8495-28 (2012). [CDE]

Stephen E. Nauyoks and Michael A. Marciniak, "Effects of a measurement floor on Mueller matrix measurements in a DRR BSDF system," Proceedings of the SPIE **8495**, 8495-32 (2012). [CDE]

**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](mailto:Kirk.Mathews@afit.edu)

**SPONSOR FUNDED RESEARCH PROJECTS**

"AFIT Research Supporting Satellite-Based Nuclear Detonation Detection." Sponsor: NNSA. Funding: \$25,000.

"Algorithm Development for AFTAC/THD 2012." Sponsor: AFTAC. Funding: \$30,000.

**MCCLORY, JOHN W.,**

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. Dr. McClory's expertise is in radiation effects on electronic devices, radiation detector development, and nuclear weapon effects. His research includes determining the effect of space and nuclear weapon radiation on electronic and structural 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 six MS and one PhD students. Dr. McClory served as the liaison officer from the Defense Threat Reduction Agency and the Senior United States Army representative at AFIT until 2012. He is a retired LTC from the US Army. He is a member of the IEEE Nuclear and Plasma Sciences Society, American Nuclear Society and Materials Research Society. Tel. 937-255-3636 x7308 (DSN 785-3636 x7308), email: [John.McClory@afit.edu](mailto:John.McClory@afit.edu)

**REFEREED JOURNAL PUBLICATIONS**

N.A. Estep, J.C. Petrosky, J.W. McClory, Y. Kim, A.J. Terzuoli, "Electromagnetic Interference and Ionizing Radiation Effects on CMOS Devices," *IEEE Transactions on Plasma Science*, Vol. 40, No. 6, pp.1495-1501, June 2012.

J.E. Bevins, K.R. Dahl, J.W. McClory, J.C. Petrosky, A.N. Caruso, "Bulk Radiation Damage Effects of a p-type B<sub>5</sub>C:H<sub>x</sub> Thin Film on n-Si Heterojunction Diode," *Journal of Radiation Effects, Research and Engineering*, Vol. 30, No. 1, pp. 33-38, February 2012.

J.C. Foster, J.W. McClory, J.C. Petrosky, E. Bielejec, "Radiation Effects on the Electrical Properties of Hafnium Oxide Based MOS Capacitors," *Journal of Radiation Effects, Research and Engineering*, Vol. 30, No. 1, pp. 113-118, February 2012.

- B.E. Kananen, A.T. Brant, J.W. McClory, J.C. Petrosky, "Characterization of Neutron Induced Defects in Lithium Tetraborate Using Electron Paramagnetic Resonance and Thermoluminescence," *Journal of Radiation Effects, Research and Engineering*, Vol. 30, No. 1, pp. 173-178, February 2012.
- N.A. Duncan, J.W. McClory, J.C. Petrosky, S. Mall, "Changes to Electrical Conductivity in Electron Irradiated Nanocomposites," *Journal of Radiation Effects, Research and Engineering*, Vol. 30, No. 1, pp. 97-102, February 2012.
- J.W. Englert, J.W. McClory, J.C. Petrosky, and L. Tauxe, "Estimating the Magnetic Field Component of an Electromagnetic Pulse Using Time Dependent Isothermal Remanent Magnetization," *Journal of Radiation Effects, Research and Engineering*, Vol. 30, No. 1, pp. 103-112, February 2012.
- A.T. Brant, B.E. Kananen, M.K. Murari, J.W. McClory, J.C. Petrosky, V.T. Adamiv, Ya. V. Burak, P.A. Dowben, and L.E. Halliburton, "Electron and hole traps in Ag-doped lithium tetraborate ( $\text{Li}_2\text{B}_4\text{O}_7$ ) crystals," *Journal of Applied Physics*, Vol. 110, Issue 9, 093719, November 2011.

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

- Brant E. Kananen, Adam T. Brant, Douglas A. Buchanan, John W. McClory, "Analysis of Neutron Induced Defects in Silver Doped Lithium Tetraborate," *IEEE Nuclear Science Symposium 2011*, Paper No. 2596, Valencia, Spain, October 2011.
- Abigail A. Bickley, Christopher Young, Benjamin Thomas, John W. McClory, Peter A. Dowben, James C. Petrosky, "Performance evaluation of neutron detectors incorporating intrinsic Gd using a GEANT4 modeling approach," *Material Research Society Symposium Proceedings*, Vol. 1341-Nuclear Radiation Detection Materials, October 2011.
- J.W. McClory, Q.T. Lu, J.C. Petrosky, S. Mall, "Durability of MWCNT Composites under Electron and Neutron Irradiation," *Hardened Electronics and Radiation Technology Conference 2012*, Paper No. D.2, Monterey, CA, March 2012.
- M.R. Halstead, S. Lee, J. Petrosky, A. Bickley, J.W. McClory, S. Clark, P. Sokol, "Neutron Flux Spectrum Characterization of a Compact, Accelerator-Driven Neutron Source at Indiana University," *Hardened Electronics and Radiation Technology Conference 2012*, Paper No. I.3, Monterey, CA, March 2012.
- J.W. Englert, J.C. Petrosky, W.F. Bailey, J.W. McClory, A. Heger, L. Tauxe, D.R. Watts, "Estimating Peak EMP Magnetic Fields Using Alternating Field Demagnetization," *Hardened Electronics and Radiation Technology Conference 2012*, Paper No. PE.4, Monterey, CA, March 2012.
- A.A. Bickley, M.R. Halstead, J.W. McClory, S. Lee, P. Sokol, J.C. Petrosky, "Evaluation of the Neutron Energy Spectrum Produced at the Neutron Radiation Effects Beam Line Utilizing a Computational Monte Carlo Approach," *Hardened Electronics and Radiation Technology Conference 2012*, Paper No. PI.2, Monterey, CA, March 2012.
- M.E. Mace, J.W. McClory, B.R. Kowash, A.A. Bickley, "Calibration of a Pulsed Neutron Source Detector System," *Hardened Electronics and Radiation Technology Conference 2012*, Paper No. I.5, Monterey, CA, March 2012.
- B.J. Singleton, B. S. Jones, J.C. Petrosky, A.A. Bickley, B.R. Kowash, and J.W. McClory, "Radiation Effects on YAG:Ce Scintillating Fiber," *Hardened Electronics and Radiation Technology Conference 2012*, Paper No. D.4, Monterey, CA, March 2012.

#### **MCHALE, STEPHEN R., LTC,**

Assistant Professor of Nuclear Engineering, Department of Engineering Physics, AFIT Appointment Date: 2011 (AFIT/ENP); BS, Engineering Physics, United States Military Academy at West Point, 1994; MS, Nuclear Engineering, Air Force Institute of Technology, 2006; PhD, Nuclear Engineering, Air Force Institute

of Technology, 2011. He has been an Army officer since 1994 serving in the United States and Asia. LTC McHale's research focuses on radiation detection materials, nuclear weapons effects, and radiation effects on electronic devices. Member of the American Nuclear Society. Tel. 937-255-3636 x4438 (DSN 785-3636 x4438), email: [Stephen.McHale@afit.edu](mailto:Stephen.McHale@afit.edu)

**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 24 PhD and 39 MS students, received 40 research grants, and published over 55 journal articles during his 20 years on the AFIT faculty. Tel. 937-255-3636 x4504 (DSN 785-3636 x4504), email: [Glen.Perram@afit.edu](mailto:Glen.Perram@afit.edu)

**SPONSOR FUNDED RESEARCH PROJECTS**

"Validated Atmospheric Propagation for Diode Pumped Alkali Lasers." Sponsor: HELJTO. Funding: \$90,000. [CDE]

"Merging Hyperspectral Imagery and Multi-Scale Modeling for Laser Lethality." Sponsor: AFOSR. Funding: \$435,354 – Perram 80%, Marciniak 20%. [CDE]

"High Power Diode Pumped Alkali Vapor Lasers and Analog Systems." Sponsor: HELJTO. Funding: \$293,564 – Perram 60%, Marciniak 20%, Gross 20%. [CDE]

"Zeeman Deceleration of a Cold Atom Beam." Sponsor: AFRL/RV. Funding: \$50,386.

"Diode Pumped Rare Gas Lasers." Sponsor: HELJTO. Funding: \$124,602. [CDE]

**REFEREED JOURNAL PUBLICATIONS**

Randall L. Bostick and Glen P. Perram "Instrumental error in chromotomosynthetic hyperspectral imaging," *Applied Optics*, Vol. 51, pp. 5186-5200 (July 2012). [CTISR]

Monte D. Anderson and Glen P. Perram, "Optical delay with spectral hole burning in Doppler-broadened cesium vapor," 285, 3264-3268, *Optics Communications*, (July 2012). [CDE]

Bryan J. Steward, Kevin C. Gross, and Glen P. Perram, "Modeling Midwave Infrared Muzzle Flash Spectra from Unsuppressed and Flash-Suppressed Large Caliber Munitions," *Infrared Physics and Technology*, Vol. 55, pp. 246-255( July 2012). [CTISR]

Randall Bostick and Glen P. Perram, "Spatial and spectral performance of a chromotomosynthetic hyperspectral imaging system," *Review of Scientific Instruments*, Vol. 83, Article No. 033110, Mar 2012. [CTISR]

Kirk C. Brown and Glen P. Perram, "Spin-orbit relaxation and quenching of cesium 7 2P in mixtures of helium, methane, and ethane," *Physical Review A* 85, Article No. 022713 (Feb 2012). [CDE]

Bryan J. Steward, Glen P. Perram, and Kevin C. Gross, "Visible and Near-Infrared Spectra of the Secondary Combustion of a 152 mm Howitzer," *Applied Spectroscopy* 65, pp. 1363-1371 (December 2011). [CTISR]

Bryan J. Steward, Kevin C. Gross, Glen P. Perram, "Optical characterization of large caliber muzzle blast waves," *Propellant, Explosives and Pyrotechnics*, Vol. 36, pp. 564-575 (December 2011). [CTISR]

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

Glen P. Perram, "Alternative Wavelengths for Optically Pumped Alkali Lasers," SPIE Defense and Security Symposium, SPIE Proc 8381-8, April 2012, Baltimore, MD. [CDE]

Charleton D. Lewis, David E. Weeks, and Glen P. Perram, "Diode Pumped Alkali Laser Kinetics: Comparison and Theory and Experiment," SPIE Defense and Security Symposium, Proc. of SPIE Vol. 8381 (2012) 83810A. [CDE]

Bryan J. Steward, Kevin C. Gross, and Glen P. Perram, "Characterization and Discrimination of Large Caliber Gun Blast and Flash Signatures," SPIE Defense and Security Symposium, SPIE Proc 8360-5, April 2012, Baltimore, MD. [CTISR]

Christopher A. Rice and Glen P. Perram, "Atmospheric Transmission for Cesium DPAL using TDLAS," SPIE Photonics West, SPIE Proc 82380I, January 2012, San Francisco, CA. [CDE]

Charles D. Fox and Glen P. Perram, "Investigation of Radial Temperature Gradients in Diode Pumped Alkali Lasers Using Tunable Diode Laser Absorption Spectroscopy," SPIE Photonics West, SPIE Proc 828306, January 2012, San Francisco, CA. [CDE]

Roberto Acosta, Kevin C. Gross, Michael A. Marciniak, and Glen P. Perram, "Mid Infrared Imaging Fourier Transform Spectrometry for high power fiber and CO<sub>2</sub> laser irradiated plexiglass, fiberglass and painted metals," SPIE Photonics West, SPIE Proc 82390R, January 2012, San Francisco, CA. [CDE]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Session Chair, "Gas Lasers" in SPIE Security and Defence, 24-27 Sept, Edinburg, Scotland, Sept 2012. [CDE]

Invited Talk - Glen P. Perram, "*Diode Pumped Alkali Laser Bleached Wave Dynamics*" SPIE Defence and Security, 24-27 Sept 2012, Edinburgh, Scotland. [CDE]

Invited Talk - Roberto Acosta, Kevin C. Gross, Michael A. Marciniak, and Glen P. Perram, "Mid Infrared Imaging Fourier Transform Spectrometry for high power fiber and CO<sub>2</sub> laser irradiated plexiglass, fiberglass and painted metals" SPIE Photonics West, January 2012, San Francisco, CA. [CDE]

SPIE Newsroom Article – Glen P. Perram, "High Power Diode Pumped Alkali Lasers" 18 January 2012, SPIE Newsroom. DOI: 10.1117/2.1201201.004013. [CDE]

#### **PETROSKY, JAMES C.,**

Associate 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](mailto:James.Petrosky@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

"Nuclear Pulse Thermal Effects on Aircraft and Missile Paint." Sponsor: AFNWC. Funding: \$25,000.

“Analysis of Carbon Nanotube Based Structural Components for Space Vehicle Structures.” Sponsor: AS&T. Funding: \$87,674 – Petrosky 25%, McClory 25%, Li 25%, Mall 25%.

“Nuclear Survivability Experimentation, Modeling and Data Verification.” Sponsor: AFNWC. Funding: \$236,000 – Petrosky 30%, McClory 35%, Kowash 35%.

#### SPONSOR FUNDED EDUCATIONAL PROJECTS

“DTRA GNE Student Support.” Sponsor: DTRA. Funding: \$45,000.

#### REFEREED JOURNAL PUBLICATIONS

N.A. Estep, J.C. Petrosky, J.W. McClory, Y. Kim, A.J. Terzuoli, “Electromagnetic Interference and Ionizing Radiation Effects on CMOS Devices,” *IEEE Transactions on Plasma Science*, Vol. 40, No. 6, pp.1495-1501, June 2012.

J.E. Bevins, K. R. Dahl, J.W. McClory, J.C. Petrosky, A.N. Caruso, “Bulk Radiation Damage Effects of a p-type B<sub>5</sub>C:H<sub>x</sub> Thin Film on n-Si Heterojunction Diode,” *Journal of Radiation Effects, Research and Engineering*, Vol. 30, No. 1, pp. 33-38, February 2012.

J.C. Foster, J.W. McClory, J.C. Petrosky, E. Bielejec, “Radiation Effects on the Electrical Properties of Hafnium Oxide Based MOS Capacitors,” *Journal of Radiation Effects, Research and Engineering*, Vol. 30, No. 1, pp. 113-118, February 2012.

B.E. Kananen, A.T. Brant, J.W. McClory, J.C. Petrosky, “Characterization of Neutron Induced Defects in Lithium Tetraborate Using Electron Paramagnetic Resonance and Thermoluminescence,” *Journal of Radiation Effects, Research and Engineering*, Vol. 30, No. 1, pp. 173-178, February 2012.

N. A. Duncan, J. W. McClory, J. C. Petrosky, S. Mall, “Changes to Electrical Conductivity in Electron Irradiated Nanocomposites,” *Journal of Radiation Effects, Research and Engineering*, Vol. 30, No. 1, pp. 97-102, February 2012.

J.W. Englert, J.W. McClory, J.C. Petrosky, and L. Tauxe, “Estimating the Magnetic Field Component of an Electromagnetic Pulse Using Time Dependent Isothermal Remanent Magnetization,” *Journal of Radiation Effects, Research and Engineering*, Vol. 30, No. 1, pp. 103-112, February 2012.

A.T. Brant, B.E. Kananen, M.K. Murari, J.W. McClory, J.C. Petrosky, V.T. Adamiv, Ya. V. Burak, P.A. Dowben, and L.E. Halliburton, “Electron and hole traps in Ag-doped lithium tetraborate (Li<sub>2</sub>B<sub>4</sub>O<sub>7</sub>) crystals,” *Journal of Applied Physics*, Vol. 110, Issue 9, 093719, November 2011.

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

M.R. Halstead, S. Lee, J.C. Petrosky, A.A. Bickley, P. Sokol, “Neutron energy spectrum characterization on TMR-1 at the Indiana University neutron source,” *Physics Procedia*, 26, 188-195 (2012), proceedings paper of the Union of Compact Accelerator-Driven Neutron Sources Conference, Bloomington, Indiana, 2011.

Abigail A. Bickley, Christopher Young, Benjamin Thomas, John W. McClory, Peter A. Dowben, James C. Petrosky, “Performance evaluation of neutron detectors incorporating intrinsic Gd using a GEANT4 modeling approach,” *Material Research Society Symposium Proceedings*, Vol. 1341-Nuclear Radiation Detection Materials, October 2011.

A.A. Bickley, M.R. Halstead, J.W. McClory, S. Lee, P. Sokol, J.C. Petrosky, “Evaluation of the Neutron Energy Spectrum Produced at the Neutron Radiation Effects Beam Line Utilizing a Computational Monte Carlo Approach,” *Hardened Electronics and Radiation Technology Conference 2012*, Proceedings Paper No. PI.2, Monterey, CA, March 2012.



B.J. Singleton, B.S. Jones, J.C. Petrosky, A.A. Bickley, B.R. Kowash, and J.W. McClory, "Radiation Effects on YAG:Ce Scintillating Fiber," *Hardened Electronics and Radiation Technology Conference 2012*, Proceedings Paper No. D.4, Monterey, CA, March 2012.

J.W. McClory, Q.T. Lu, J.C. Petrosky, S. Mall, "Durability of MWCNT Composites under Electron and Neutron Irradiation," *Hardened Electronics and Radiation Technology Conference 2012*, Paper No. D.2, Monterey, CA, March 2012.

M.R. Halstead, S. Lee, J. Petrosky, A. Bickley, J.W. McClory, S. Clark, P. Sokol, "Neutron Flux Spectrum Characterization of a Compact, Accelerator-Driven Neutron Source at Indiana University," *Hardened Electronics and Radiation Technology Conference 2012*, Paper No. I.3, Monterey, CA, March 2012.

J.W. Englert, J.C. Petrosky, W.F. Bailey, J.W. McClory, A. Heger, L. Tauxe, D.R. Watts, "Estimating Peak EMP Magnetic Fields Using Alternating Field Demagnetization," *Hardened Electronics and Radiation Technology Conference 2012*, Paper No. PE.4, Monterey, CA, March 2012.

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

Briana J. Singleton, Bradley S. Jones, Abigail A. Bickley, James C. Petrosky, John W. McClory, Benjamin R. Kowash, "Radiation Effects on YAG:Ce Scintillating Fiber," Proceedings of the *IEEE Nuclear Science Symposium 2011*, Valencia, Spain, 24 – 28 October 2011.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Taught/directed an invited short course at the 2012 HEART Conference titled "Nuclear Weapons Generated Electromagnetic Pulse: Foundations to Applications".

#### **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 serves as AFIT's chief research officer, primary liaison to the Air Force Research Laboratory, and co-PI of the LEADER consortium, an NSF ADVANCE project. Dr. Ries' research interests include radiation effects, nonlinear optical materials, electron paramagnetic resonance spectroscopy, and laser processing of materials. Prior to joining the AFIT faculty, Dr. Ries served as Director of the Center for Materials Research at Norfolk State University in Norfolk, Virginia, and Associate Director of the Applied Research Center at the Jefferson Center for Research and Technology Research Park in Newport News, Virginia. Dr. Ries was elected to the ASEE Engineering Research Council Board of Directors in 2008, and is serving a two-year term as Secretary/Treasurer (2011-2013.) She has served on the Engineering and Science Foundation of Dayton Board since 2005, and as its Secretary/Treasurer since 2012. She was recognized by the Dayton Daily News as one of the region's 2009 Ten Top Women, and was the Air Force's civilian winner of the 2011 Department of Defense Women's History Month Foreign Language and Science, Technology, Engineering and Math (STEM) Role Model Award. Tel. 937-255-3636 x4544 (DSN 785-3636 x4544), email: [Heidi.Ries@afit.edu](mailto:Heidi.Ries@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

"FY12 AFOSR Speaker Funds." Sponsor: AFOSR. Funding: \$19,080.

#### SPONSOR FUNDED EDUCATIONAL PROJECTS

"Launching Equity in the Academy across the Dayton Entrepreneurial Region (LEADER)." Sponsor: NSF. Funding: \$35,590.

## OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Board of Directors and Secretary/Treasurer, 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.

## SPONSOR FUNDED RESEARCH PROJECTS

"Muon Chemistry in Plasmas for Imaging." Sponsor: AFOSR. Funding: \$39,862.

### **TUTTLE, RONALD F.,**

Associate Professor of Nuclear Engineering, Department of Engineering Physics, AFIT Appointment Date: 2001 (AFIT/ENP); BS, Chemical Engineering, University of Missouri (Columbia), 1968; MS, Nuclear Engineering, University of Missouri (Columbia), 1970; PhD, Nuclear Engineering, University of Missouri (Columbia), 1980. Dr. Tuttle's research areas include applications of active and passive remote sensing, spectroscopy, diagnostics, and signals processing to problems in intelligence collection and exploitation. Other areas of interest include nuclear weapon effects and space nuclear power systems modeling and mechanics of aerosols. He has published in both unclassified and classified refereed archival journals and conference proceedings. Dr. Tuttle served as Director, Center for Technical Intelligence Studies and Research (CTISR), AFIT, until August 2012. Tel. 937-255-3636 x4536 (DSN 785-3636 x4536), email: [Ronald.Tuttle@afit.edu](mailto:Ronald.Tuttle@afit.edu)

### **WACKER, ROBERT S., Lt Col,**

Assistant Professor of Atmospheric Science, Department of Engineering Physics, AFIT Appointment Date: 2012 (AFIT/ENP); BS, United States Air Force Academy, 1995; MS, Texas A&M University, 1997; PhD, University of Wisconsin-Madison, 2005. Lt Col Wacker's research covers a wide range of topics in the atmospheric sciences. His recent work has focused on lightning detection, microwave remote sensing of tropical cyclones, and aviation weather. Before joining AFIT, he was a Physics faculty member at the United States Air Force Academy, Director of Operations of the 21<sup>st</sup> Operational Weather Squadron, and NATO's Chief Meteorology Officer in Afghanistan. He is a member of the American Meteorological Society and the Air Weather Association. Tel. 937-255-3636 x4609 (DSN 785-3636 x4609), email: [Robert.Wacker@afit.edu](mailto:Robert.Wacker@afit.edu)

### **WALLI, KARL C., 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](mailto:Karl.Walli@afit.edu).

#### SPONSOR FUNDED RESEARCH PROJECTS

“Imagery Based Site Modeling.” Sponsor: AFRL/RV. Funding: \$25,000.

“Physics Based NUDET Modeling.” Sponsor: NNSA. Funding: \$25,000 – Walli 75%, Bunker 25%. [CTISR]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Invited talk, titled “3D Metrics Workshop on Site Modeling using LIDAR and Computer Vision techniques,” presented at workshop sponsored by the LADAR and Optical Communications Institute, University of Dayton (31 May 2012).

#### **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](mailto:David.Weeks@afit.edu)

#### REFEREED JOURNAL PUBLICATIONS

L Blank (DS), D.E. Weeks, and G.S. Kedsiora, “M+Ng Potential Energy Curves Including Spin-Orbit Coupling for M = K, Rb, Cs, and Ng = He, Ne, Ar,” *Journal of Chemical Physics* **136** (2012) 124315-124323.

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

Charleton D. Lewis, David E. Weeks, and Glen P. Perram, “Diode Pumped Alkali Laser Kinetics: Comparison and Theory and Experiment,” *SPIE Defense and Security Symposium, Proc. of SPIE* **8381** (2012) 83810A.

#### **WEIDNER, JOHN W., LTC**

Research Assistant Professor of Nuclear Engineering, Department of Engineering Physics, AFIT Appointment Date: 2012 (AFIT/ENP); B.S., Applied Physics, St. John’s University, Collegeville, MN, 1991; M.S., Engineering Management, University of Missouri-Rolla, 1996; M.S., Nuclear Engineering, University of Wisconsin-Madison, 2003; M.S., Medical Physics, University of Wisconsin-Madison, 2003; Ph.D., Medical Physics, University of Wisconsin-Madison, 2012. LTC Weidner is assigned to the Defense Threat Reduction Agency (DTRA) and manages a DTRA-sponsored research program in AFIT/ENP that spans the areas of nuclear detection, forensics, survivability and effects. LTC Weidner is a registered professional engineer in the state of Wisconsin and previously served as an Assistant Professor in the Department of Physics and Nuclear Engineering at the United States Military Academy, West Point, NY. He is the author of five publications in refereed journals. Tel. 937-255-3636 x4697 (DSN 785-3636 x4697), email: [John.Weidner@afit.edu](mailto:John.Weidner@afit.edu)

#### **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](mailto:Paul.Wolf@afit.edu)

**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 115 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 band gap semiconductors such as GeSn and SiGeSn, This work involves collaborative effort with the University of Arizona, University of Delaware, Kangwon National University, and Taiwan National University. He has directed the research of 8 post-doctoral fellows, 17 PhD students, and 25 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](mailto:Yung.Yeo@afit.edu)

**SPONSOR FUNDED RESEARCH PROJECTS**

"Investigation of Optical and Electrical Properties of GeSn and SiGeSn Material Systems for the Si-Based Light Emitter Applications." Sponsor: AFOSR. Funding: \$51,800.

"Optical and Electrical Characterization of Direct Bandgap GeSn and GeSiSn Semiconductors and Devices." Sponsor: AFOSR. Funding: \$80,000.

**REFEREED JOURNAL PUBLICATIONS**

Cho, Hak Dong, Zakirov, Anvar S., Yuldashev, Shavkat U., Ahn, Chi Won, Yeo, Yung Kee, and Kang, Tae Won, "Photovoltaic device on a single ZnO nanowire p-n homojunction," *Nanotechnology* 23, 115401 (6pp), March 2012.

Moore, E.A., Yeo, Y.K., and Ryu, Mee-Yi, "Ion-dose and anneal-temperature dependent studies of silicon-implanted  $\text{Al}_x\text{Ga}_{1-x}\text{N}$ ," *Current Applied Physics* 12, 123-128, Jan 2012.

**ZENS, TIMOTHY W., Capt**

Assistant Professor of Materials Science, Department of Engineering Physics, AFIT Appointment Date: 2012 (AFIT/ENP); BS Physics and BS Mathematics, University of Minnesota, Minneapolis; MS, Air Force Institute of Technology, 2005; PhD, Massachusetts Institute of Technology, 2011; Academic Awards: American Legion Scholastic Award, 2000; Society of the War of 1812 Award (for Academic Excellence), 2001; American Veterans Award (Scholastic), 2003; American Association for Crystal Growth; Bonner Memorial scholarship, 2006 and 2007. Dr Zens has expertise in synthesis of electronic and optical materials and devices. His research is focused on: long wavelength IR detectors from polycrystalline  $\text{Pb}_{1-x}\text{Sn}_x\text{Te}$  films; synthesis of bulk  $\text{ThO}_2$  and  $\text{UO}_2$  crystals using hydrothermal growth techniques; growth of 2D BN on graphene using molecular beam epitaxy for high power electronics; and orientation patterned infrared non-linear optical materials for infrared countermeasures and terahertz generation. Tel. 937-255-3636 x 4695 (DSN 785-3636 x4695), email: [Timothy.Zens@afit.edu](mailto:Timothy.Zens@afit.edu)

**REFEREED JOURNAL PUBLICATIONS**

Jianfei Wang, Timothy Zens, Juejun Hu, Piotr Becla, Lionel C. Kimerling, and Anuradha M. Agarwal. "Monolithically integrated, resonant-cavity-enhanced dual-band mid-infrared photodetector on silicon," *Applied Physics Letters* Vol. 100, Article No. 211106 (2012).

Timothy Zens, Piotr Becla, Anuradha M. Agarwal, Lionel C. Kimerling, Alvin Drehman. "Long wavelength infrared detection using amorphous InSb and InAs<sub>0.3</sub>Sb<sub>0.7</sub>," *Journal of Crystal Growth* Vol. 334, pp. 84-89 (2011).

## **5.4. DEPARTMENT OF MATHEMATICS AND STATISTICS**

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<b>5.4.1</b>	<b><u><a href="#">DOCTORAL DISSERTATIONS</a></u></b>	<b>145</b>
<b>5.4.2</b>	<b><u><a href="#">MASTER'S THESES</a></u></b>	<b>145</b>
<b>5.4.3</b>	<b><u><a href="#">FACULTY BIOGRAPHIES &amp; RESEARCH OUTPUT</a></u></b>	<b>146</b>

#### **5.4.1. DOCTORAL DISSERTATIONS**

MASSAR, MELODY R., *Local Histograms for Per-Pixel Classification*. AFIT/DAM/ENC/12-02. Faculty Advisor: Dr. Matthew C. Fickus. Sponsor: N/A.

#### **5.4.2. MASTER'S THESES**

DOWLING, AUSTIN W., *Using Predictive Analytics to Detect Major Problems in Department of Defense Acquisition Programs*. AFIT/GCA/ENC/12-03. Faculty Advisor: Dr. Edward D. White. Sponsor: OSD.

FOLEY, BETHANY G., *A Dempster-Shafer Method for Multi-Sensor Fusion*. AFIT/GAM/ENC/12-03. Faculty Advisor: Dr. Aihua W. Wood. Sponsor: AFOSR. [ANT]

MILLER, TREVOR P., *Acquisition Program Detection Using Text Mining Methods*. AFIT/GCA/ENC/12-02. Faculty Advisor: Dr. Edward D. White. Sponsor: OSD.

MITCHELL, TARAH D., *A Women-Only Comparison of the U.S. Air Force Fitness Test and the Marine Combat Fitness Test*. AFIT/GCA/ENC/12-01. Faculty Advisor: Dr. Edward D. White. Sponsor: N/A.

RODRIGUEZ, ALAN R., *Prediction of Travel Voucher Demand at the Air Force Financial Services Center*. AFIT/GCA/ENC/12-M04. Faculty Advisor: Lt Col Richard L. Warr. Sponsor: SAF/FM.

SMITH, LINDSAY N., *Determining Angular Frequency from a Video with a Generalized Fast Fourier Transform*. AFIT/GAM/ENC/12-02. Faculty Advisor: Dr. Matthew C. Fickus. Sponsor: N/A.

STEIGERWALD, ROBERT A., *Analysis of Doppler-Only Passive Radar for Satellite Orbit Parameterization*. AFIT/GAM/ENC/12-01. Faculty Advisor: Dr. William P. Baker. Sponsor: AFRL/RV.

VENZIN, ALEXANDER M., *Quantifying Performance Bias in Label Fusion*. AFIT/GAM/ENC/12-04. Faculty Advisor: Dr. Christine M. Schubert Kabban. Sponsor: AFRL/RB.

### 5.4.3. FACULTY BIOGRAPHIES & RESEARCH OUTPUT

Notes: Research Center affiliations are listed in [ ] if applicable. Shared credit for funding awards is indicated by the percentages shown for each faculty member associated with the project.

#### **AKERS, BENJAMIN F.,**

Assistant Professor of Mathematics, Department of Mathematics and Statistics, AFIT Appointment Date: 2011 (AFIT/ENC); BS, Pennsylvania State University, 2003; MA, University of Wisconsin - Madison, 2005; PhD, University of Wisconsin - Madison, 2008. Dr. Akers' research interests include nonlinear waves, applied mathematics, fluid mechanics, and numerical analysis. Dr. Akers current research considers the stability and existence of traveling water waves, especially developing numerical methods for problems with two-dimensional kernels. Tel. 937-255-3636 x4522 (DSN 785-3636 x4522), email: [Benjamin.Akers@afit.edu](mailto:Benjamin.Akers@afit.edu)

#### REFEREED JOURNAL PUBLICATIONS

Akers, B. and D. P. Nicholls, Spectral stability of deep two-dimensional gravity water waves: repeated eigenvalues, *SIAM Journal on Applied Mathematics* **72** (2012), 689-711.

Akers, B., Surfactant influence on water wave packets, *Studies in Applied Mathematics* **129** (2012), 91-102.

Akers, B. and W. Gao, Wilton ripples in weakly nonlinear model equations, *Communications in Mathematical Sciences* **10** (2012), 1015-1024.

Akers, B., The generation of capillary-gravity solitary waves by a surface pressure forcing, *Mathematics and Computers in Simulation* **82** (2012), 958-967.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Akers, B., "Wilton ripples in weakly nonlinear models," SIAM Conference on Nonlinear Waves and Coherent Structures, University of Washington, Seattle, WA, June, 2012.

Organized special session "Traveling water waves and their stability," at SIAM Conference on Nonlinear Waves and Coherent Structures, University of Washington, Seattle, WA, June, 2012.

#### **BAKER, WILLIAM P.,**

Associate Professor of Mathematics, Department of Mathematics and Statistics, AFIT Appointment Date: 1986 (AFIT/ENC); BA, University of California at Irvine, 1969; MA, University of California at Irvine, 1970; PhD, Northwestern University, 1987. Dr. Baker's research interests include asymptotic and perturbation methods, wave propagation and scattering theory, applied mathematics, functional analysis, low observables, and numerical analysis. Dr. Baker's current research is in thermal dynamics of high speed wear, vibrational dynamics of thermally loaded materials and dynamics and control of satellite structures. Dr. Baker is a Master Navigator with prior military assignments in flight test, satellite communications, cruise missile and radar analysis. Tel. 937-255-3636 x4517 (DSN 785-3636 x4517), email: [William.Baker@afit.edu](mailto:William.Baker@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

"Pulse Forensics Enhanced Real-Time De-Interleaving (HORSE)." Sponsor: AFRL/RV. Funding: \$30,000 – Baker 60%, Oxley 40%.

#### REFEREED JOURNAL PUBLICATIONS

Hale, C.S., A.N. Palozotto, and W.P. Baker, Engineering approach for the evaluation of mechanical wear considering the experimental Holloman High-Speed Test Track, *Journal of Engineering Mechanics* **138** (2012), 1127-1140.



#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Buentello, R., A. Palazotto, and W. Baker, "The evaluation of material failure due to high speed sliding," 37<sup>th</sup> Annual Dayton-Cincinnati Aerospace Science Symposium, Dayton, OH, March, 2012.

#### **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](mailto:Dursun.Bulutoglu@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

"Constraint Programming Heuristic Algorithms and Computer Generated GWP Lower Bounds for Finding Efficient Designs and Test Suites for Test and Evaluation." Sponsor: AFOSR. Funding: \$46,529.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Bulutoglu, D., "Finding GMA Designs by Enumeration," AFOSR Program Review, Arlington, VA, April, 2012.

Reviewer for *Computational Statistics and Data Analysis*.

Guest Editor for *International Journal of Combinatorics*.

#### **CAPEHART, SHAY R., Lt Col,**

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.

#### REFEREED JOURNAL PUBLICATIONS

Capehart, S.R., A. Keha, M. Kulahci, and D.C. Montgomery, Designing fractional factorial split-plot experiments using integer programming. *International Journal of Experimental Design and Process Optimisation* **2** (2011), 34–57.

Hill, R.R., D.A. Leggio, S.R. Capehart, and A.G. Roesener, Examining improved experimental designs for wind tunnel testing using Monte Carlo sampling methods. *Quality and Reliability Engineering International* **27** (2011), 795-803.

**CHAPIN, PATRICK S., Maj**

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. Maj Chapin's research interests include computer experiments, validation of computer models, design of experiments, MCMC simulation and Bayesian Statistics. He has served as an Air Force analytical scientist for 3 years including manpower/force structure analysis and BRAC cost analysis. Tel. 937-255-3636 x3320 (DSN 785-3636 x3320), email: [Patrick.Chapin@afit.edu](mailto:Patrick.Chapin@afit.edu)

**REFEREED JOURNAL PUBLICATIONS**

Hoopes D. J., D. Kaziska, P. Chapin, D. Weed, B. D. Smith, E. R. Hale, and P. A. Johnstone, Patient preferences and physician practice patterns regarding breast radiotherapy. *International Journal of Radiation Oncology, Biology and Physics* **82** (2012), 674–681.

**OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES**

Reviewer for *Naval Research Logistics*.

**CORDEIRO, JAMES D., Maj,**

Assistant Professor of Statistics, Department of Mathematics and Statistics, AFIT Appointment Date: 2010, (AFIT/ENC); BA, University of California, Berkeley, 1989; MS, University of Washington, 1992; MS, Air Force Institute of Technology, 1998; PhD, Air Force Institute of Technology, 2007. Maj Cordeiro's primary research interests include stochastic modeling and Markov decision processes. He has served as an Air Force analyst for most of his career, specializing in such areas as operational test and evaluation and manpower and personnel at Headquarters, U.S. Air Force. He has also held the rank of Assistant Professor at the U.S. Air Force Academy. Tel. 937-255-3636 x4398, email: [James.Cordeiro@afit.edu](mailto:James.Cordeiro@afit.edu)

**REFEREED JOURNAL PUBLICATIONS**

Cordeiro, J.D. and J.P. Kharoufeh, The unreliable M/M/1 retrial queue in a random environment. *Stochastic Models* **28** (2012), 29-48.

**OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES**

Reviewer for *Journal of Statistical Theory and Practice* and *Naval Research Logistics*.

**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. Lt Col 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. Lt Col Dea's previous military assignments include software development for strategic war-planning systems, flight test support and coordination, and architecture and systems engineering for long-term space superiority mission area planning. Tel. 937-255-3636 x4584, email: [John.Dea@afit.edu](mailto:John.Dea@afit.edu)

**ERICH, ROGER A., Capt,**

Assistant Professor of Statistics, Department of Mathematics and Statistics, AFIT Appointment Date: 2011, (AFIT/ENC); BS, The Pennsylvania State University, 2003; MS, Air Force Institute of Technology, 2005; MS, The Ohio State University, 2009; PhD, The Ohio State University, 2012. Capt Erich's research interests include biostatistics, survival analysis, and threshold regression. He has served as an Air Force analytical scientist for 3 years conducting wargaming operations-analysis. Tel. 937-255-3636 x7124 (DSN 785-3636 x7124), email: [Roger.Erich@afit.edu](mailto:Roger.Erich@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](mailto:Matthew.Fickus@afit.edu)

**SPONSOR FUNDED RESEARCH PROJECTS**

“Theory of Multiresolution Classification with Bases and Frames.” Sponsor: NSF. Funding: \$18,171.

“Fusion Frames for Distributed Processing and Communication.” Sponsor: AFOSR. Funding: \$27,337.

“ATD: Frame-Theoretic Information Fusion for Threat Detection.” Sponsor: NSF. Funding: \$62,728.

**REFEREED JOURNAL PUBLICATIONS**

Fickus, M. and D.G. Mixon, Optimal frames and Newton's method, *Numerical Functional Analysis and Optimization* **33** (2012), 971-988.

Fickus, M. and D.G. Mixon, Numerically erasure-robust frames, *Linear Algebra and Its Applications* **437** (2012), 1394-1407.

Balcan, D.C., G. Srinivasa, M. Fickus, and J. Kovacevic, Guaranteeing convergence of iterative skewed voting algorithms for image segmentation, *Applied Computational Harmonic Analysis* **33** (2012), 300-308.

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Casazza, P.G., M. Fickus, and D.G. Mixon, Auto-tuning unit norm frames, *Applied Computational Harmonic Analysis* **32** (2012), 1-15.

Casazza, P. G., M. Fickus, A. Heinecke, Y. Wang, and Z. Zhou, Spectral tetris fusion frame constructions, *Journal of Fourier Analysis and Applications* **18** (2012), 828-851.

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

Casazza, P. G., M. Fickus, A. Heinecke, Y. Wang, and Z. Zhou, Spectral tetris fusion frame constructions, *Proceedings of SPIE* **8138** (2011), 813816/1-6.

Massar, M.L., R. Bhagavatula, J.A. Ozolek, C.A. Castro, M. Fickus, and J. Kovacevic, A domain-knowledge-inspired mathematical framework for the description and classification of H&E stained histopathology images, *Proceedings of SPIE* **8138** (2011), 81380U/1-7.

Fickus, M. and D.G. Mixon, Deterministic matrices with the restricted isometry property, *Proceedings of SPIE* **8138** (2011), 81380A/1-6.

Fickus, M., D. G. Mixon, and M. J. Poteet, Frame completions for optimally robust reconstruction, *Proceedings of SPIE* **8138** (2011), 81380Q/1-8.

**BOOKS AND CHAPTERS IN BOOKS**

Fickus, M., D.G. Mixon, M.J. Poteet, “Constructing Finite Frames with a Given Spectrum,” *Finite Frames: Theory and Applications*, P. G. Casazza and G. Kutyniok eds., Birkhauser, New York, NY, Chapter 2, pp. 55-107, 2012.

Fickus, M., M.L. Massar, D.G. Mixon, "Finite Frames and Filter Banks," *Finite Frames: Theory and Applications*, P. G. Casazza and G. Kutyniok eds., Birkhauser, New York, NY, Chapter 10, pp. 337-379, 2012.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Reviewer for AFOSR, ARO, *Appl. Comput. Harmon. Anal.*, *Houston J. Math.*, *IEEE Trans. Inform. Theory*, *J. Fourier Anal. Appl.*, *Linear Algebra Appl.*, *Am. Control Conf.*, and *IEEE Int. Symp. Inform. Theory*.

Fickus, M. "Numerically erasure-robust frames," Operator Algebras, Frames, and Undergraduate Research: A Conference in Honor of the 70th Birthday of David R. Larson, College Station, TX, July, 2012.

Fickus, M., "Numerically erasure-robust frames," Mathematisches Forschungsinstitut Oberwolfach Workshop on Applied Harmonic Analysis and Sparse Approximation, Oberwolfach, Germany, June, 2012.

Fickus, M., "Robust communication and numerically erasure-robust frames," Quantitative Methods in Defense and National Security, Fairfax, VA, May, 2012.

Fickus, M., "Constructing all finite unit norm tight frames," AMS Spring Eastern Meeting, Special Session on Analysis of Wavelets, Frames, and Fractals, Washington DC, March, 2012.

Fickus, M., "Robust communication and numerically erasure-robust frames," DARPA Mathematics Summit, Lake Tahoe, NV, February, 2012.

Fickus, M., "Frame completions via eigensteps," AFOSR Program Review on Information Fusion and Distributed Intelligence, Arlington, VA, November, 2011.

#### **LAIR, ALAN V.,**

Professor of Mathematics and Head, Department of Mathematics and Statistics, AFIT Appointment Date: 1982, (AFIT/ENC); BA, North Texas State University, 1970; MS, Texas Tech University, 1972; PhD, Texas Tech University, 1976. Dr. Lair's research interests include parabolic and elliptic partial differential equations, functional analysis, applied mathematics, and nonlinear diffusion. He has published several papers on the properties of solutions of various nonlinear partial differential equations. Tel. 937-255-3636 x4519 (DSN 785-3636 x4519), email: [Alan.Lair@afit.edu](mailto:Alan.Lair@afit.edu)

#### REFEREED JOURNAL PUBLICATIONS

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

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Editorial Board, *ISRN Mathematical Analysis*.

Reviewer for *Mathematical Reviews*.

**MCBEE, BRIAN K., Lt Col,**

Assistant Professor of Mathematics, Department of Mathematics and Statistics, AFIT Appointment Date: 2011. (AFIT/ENC); BS, Brigham Young University, 1992; MS, University of Colorado, Colorado Springs, 1998; MS, The Ohio State University, 2004; MS, Virginia Polytechnic and State University, 2011; PhD, Virginia Polytechnic and State University, 2011. Lt Col McBee's primary research interests include numerical partial differential equations and control as applied to fluid dynamics, numerical methods with emphasis on finite elements, geodetic science, and applications of mathematics in intelligence gathering. He has served as an intelligence officer providing RC-135 support and reporting, near-real-time space and missile events analysis, foreign counter-space capabilities assessments, battlestaff-level modeling and simulation exercise support, and national-agency-level training and education oversight for Title X training as well as Advanced Geospatial Intelligence (AGI) and synthetic aperture radar (SAR) exploitation. Tel. 937-255-3636 x4635 (DSN 785-3636x4635), email: [Brian.McBee@afit.edu](mailto:Brian.McBee@afit.edu)

**MIXON, DUSTIN G., Capt**

Assistant Professor of Mathematics, Department of Mathematics and Statistics, AFIT Appointment Date: 2012. (AFIT/ENC); BS, Central Washington University, 2004; MS, Air Force Institute of Technology, 2006; MA, Princeton University, 2010; PhD, Princeton University, 2012. Capt Mixon's research interests include applied harmonic analysis, frame theory, compressed sensing and signal processing. He has served as an Air Force analytical scientist for 3 years modeling biological responses to radiofrequency radiation. Tel. 937-255-3636 x4516 (DSN 785-3636 x4516), email: [Dustin.Mixon@afit.edu](mailto:Dustin.Mixon@afit.edu)

**REFEREED JOURNAL PUBLICATIONS**

Fickus, M. and D.G. Mixon, Optimal frames and Newton's method, *Numerical Functional Analysis and Optimization* **33** (2012), 971-988.

Fickus, M. and D.G. Mixon, Numerically erasure-robust frames, *Linear Algebra and Its Applications* **437** (2012), 1394-1407.

Bajwa, W.U., R. Calderbank, and D.G. Mixon, Two are better than one: fundamental parameters of frame coherence, *Applied and Computational Harmonic Analysis* **33** (2012) 58-78.

Fickus, M., D.G. Mixon, and J.C. Tremain, Steiner equiangular tight frames, *Linear Algebra and Its Applications* **436** (2012), 1014-1027.

Casazza, P.G., M. Fickus, and D.G. Mixon, Auto-tuning unit norm frames, *Applied Computational Harmonic Analysis* **32** (2012), 1-15.

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

Fickus, M. and D.G. Mixon, Deterministic matrices with the restricted isometry property, *Proceedings of SPIE* **8138** (2011), 81380A/1-6.

Fickus, M., D.G. Mixon, and M.J. Poteet, Frame completions for optimally robust reconstruction, *Proceedings of SPIE* **8138** (2011), 81380Q/1-8.

**BOOKS AND CHAPTERS IN BOOKS**

Fickus, M., D.G. Mixon, and M.J. Poteet, "Constructing Finite Frames with a Given Spectrum," *Finite Frames: Theory and Applications*, P. G. Casazza and G. Kutyniok eds., Birkhauser, New York, NY, Chapter 2, pp. 55-107, 2012.

Fickus, M., M.L. Massar, and D.G. Mixon, "Finite Frames and Filter Banks," *Finite Frames: Theory and Applications*, P.G. Casazza and G. Kutyniok eds., Birkhauser, New York, NY, Chapter 10, pp. 337-379, 2012.

## OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Reviewer for *Adv. Comput. Math., Appl. Comput. Harmon. Anal., IEEE Trans. Inform. Theory, J. Fourier Anal. Appl., and Sampl. Theory Signal Image Process.*

Mixon, D.G., "Phaseless recovery with polarization," Quantitative Methods in Defense and National Security, Fairfax, VA, May, 2012.

Mixon, D.G., "The road to deterministic matrices with the restricted isometry property," SIAM Southeastern Atlantic Section Conference, Huntsville, AL, March, 2012.

### **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 (Renamed to University of the Cumberlands in 2005); 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 and AFRL/RB 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 specifically, ROC curves and ROC manifolds. Tel. 937-255-3636 x4515 (DSN 785-3636 x4515), email: [Mark.Oxley@afit.edu](mailto:Mark.Oxley@afit.edu)

## SPONSOR FUNDED RESEARCH PROJECTS

"Nonlinear-Nonconvex Compressive Sensing." Sponsor: AFRL/RI. Funding: \$35,000. [ANT]

"Agent and Situation Fusion." Sponsor: AFRL/RX. Funding: \$10,000.

"Receiver Operating Characteristic Analysis for Detecting Explosives-Related Threats." Sponsor: PNNL. Funding: \$26,400.

## REFEREED JOURNAL PUBLICATIONS

Lacey, T.H., R.F. Mills, B.E. Mullins, R.A. Raines, M.E. Oxley, and S.K. Rogers, RIPsec - using reputation-based multilayer security to protect MANETs, *Computers and Security* **31** (2012), 122-136.

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

Reising, D., M.A. Temple and M.E. Oxley, Gabor-based RF-DNA fingerprinting for classifying 802.16e WiMAX mobile subscribers, *International Conference on Computing, Networking and Communications* (2012), 7-13.

Culbertson, J., K. Sturtz, M. Oxley and S.K. Rogers, Probabilistic situations for reasoning, *Proceedings of COGSIMA 2012*, 230-234.

Reynolds, M.B., D.R. Hulce, K.M. Hopkinson, M.E. Oxley, and B.E. Mullins, Cloud chamber: a self organizing facility to create, exercise, and examine software as service tenants, *Hawaii International Conference on System Sciences (HICSS)* (2012), 5546-5555.

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

Culbertson, J., K. Sturtz and M.E. Oxley, Representations of probabilistic situations, *Proceedings of SPIE, Signal Processing, Sensor Fusion, and Target Recognition XXI* **8392** (2012), paper 36. [ANT]

Oxley, M., J. Fitch, C. Schubert Kabban, Feature fusion of detection systems via their ROC functions, *Proceedings of SPIE, Signal Processing, Sensor Fusion, and Target Recognition XXI* **8392** (2012), paper 37. [ANT]

Fitch, J., M. Oxley, and C. Schubert Kabban, Label fusion of classification systems via their ROC functions, *Proceedings of SPIE, Signal Processing, Sensor Fusion, and Target Recognition XXI* **8392** (2012), paper 38. [ANT]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Oxley, M., "Information Fusion," Pacific Northwest National Laboratories, Richland, WA, May, 2012. [ANT]

Paper Review Manager for *Information Fusion*.

Referee for *Applied Optics*, *Advances in Information Fusion*, and *Information Fusion*.

Technical Program Committee Member for 2012 IEEE International Multi-Disciplinary Conference on Cognitive Methods in Situation Awareness and Decision Support (CogSIMA 2012), New Orleans, LA, March, 2012.

#### **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](mailto:Kevin.Pond@afit.edu)

#### **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.

#### **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 information-fused systems via ROC methodology, sequential strategies for classification, 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](mailto:Christine.Schubertkabban@afit.edu)

**SPONSOR FUNDED RESEARCH PROJECTS**

“Sequencing Classification Systems for Improved Accuracy and Reduced Cost.” Sponsor: AFOSR. Funding: \$37,386.

“Performance Evaluation and Validation in Structural Health Monitoring Systems.” Sponsor: AFOSR. Funding: \$160,542.

**REFEREED JOURNAL PUBLICATIONS**

Ahmed, A.E., D.K. McClish, and C.M. Schubert, Accuracy and cost comparison in medical testing using sequential testing strategies, *Statistics in Medicine* **30** (2011), 3416-3430.

Barker, R.T., J.S. Knisely, S.B. Barker, R.K. Cobb, and C.M. Schubert, Preliminary investigation of employee's dog presence on stress and organizational perceptions, *International Journal of Workplace Health Management* **5** (2012), 5-30.

Bajaj, J.S., P.M. Gillevet, N.R. Patel, V. Ahluwalia, J.M. Ridlon, B. Kettenmann, C.M. Schubert, M. Sikaroodi, D.M. Heuman, M. M.E. Crossey, D.E. Bell, P.B. Hylemon, P.P. Fatouros, and S.D. Taylor-Robinson, A longitudinal systems biology analysis of lactulose withdrawal in hepatic encephalopathy, *Metabolic Brain Disease* **27** (2012), 205-215.

Sun, S. S., X. Deng, R. Sabo, R. Carrico, C.M. Schubert, W. Wan, and C. Sabo, Secular trends in body composition for children and young adults: The Fels Longitudinal Study, *American Journal of Human Biology* **24** (2012), 506-514.

Sayler, J., C.M. Schubert, and C. Chiaranai, Supportive relationships, self-care confidence and heart failure self-care, *Journal of Cardiovascular Nursing* **27** (2012), 384-393.

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

Ryan, E., D.R. Jacques, J. Colombi, and C.M. Schubert Kabban, A methodology to characterize the accuracy of life cycle costs for DOD programs, (CSER 2012 Systems Science and Thinking) *Procedia Computer Science* **8** (2012), 361-369.

Ryan, E.T., D.R. Jacques, C.M. Schubert, and J.D. Ritschel, Characterizing the accuracy of DOD life cycle costs, *Proceedings of the 22<sup>nd</sup> Annual INCOSE International Symposium* (2012).

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

Wooddell, D.A., C.M. Schubert Kabban, and R.R. Hill, An analysis of the influences of biological variance, measurement error, and uncertainty on retinal photothermal damage threshold studies, Optical Interactions with Tissue and Cells XXIII ed by E. Duco Jansen, Robert Thomas. *Proceedings of the SPIE* **8221** (2012), 822114, 1-16.



Oxley, M., J. Fitch, C. Schubert Kabban, Feature fusion of detection systems via their ROC functions, *Proceedings of SPIE, Signal Processing, Sensor Fusion, and Target Recognition XXI* **8392** (2012), paper 37.

Fitch, J., M. Oxley, and C. Schubert Kabban, Label fusion of classification systems via their ROC functions, *Proceedings of SPIE, Signal Processing, Sensor Fusion, and Target Recognition XXI* **8392** (2012), paper 38.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Schubert Kabban, C., “Cost and Accuracy Comparisons Using Sequential Classification Strategies for Two Classification Systems,” AFOSR Program Review on Information Fusion and Distributed Intelligence, Ballston, VA, November, 2011.

Schubert Kabban, C., Performance Evaluation and Validation in Structural Health Monitoring Systems, AFOSR Program Review on Multi-Scale Structural Mechanics & Prognosis, Ballston, VA, July, 2012.

Brandt, Y., L. Currier, C.M. Schubert Kabban, and A. Tvaryanas, Core Strength Exercise as a Mitigator for Lower Back Pain (LBP) in USAF Helicopter Aircrew,” Defense Safety Oversight Committee, Washington, D. C., May, 2012.

Member, Technical Program Committee for CSER 2012: Conference on Systems Engineering Research (CSER), St Louis, MO, March, 2012.

Featured STEM faculty, LEADER Ledger, Vol. 2, Issue 6, February, 2012.

Grant reviewer for Center for Human Animal Interaction, Virginia Commonwealth University, Richmond, VA.

#### **WARR, RICHARD L., Lt Col,**

Assistant Professor of Statistics and Deputy Department Head, 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. Lt Col 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](mailto:Richard.Warr@afit.edu)

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Collins, D.H., J.K. Freels, A.V. Huzurbazar, R.L. Warr, and B.P. Weaver, “Accelerated test methods for reliability prediction,” ADTSC Science Highlights 2012, LAUR 12-20429, pp. 134–135, June, 2012.

Warr, R.L., “Bayesian semi-Markov models for combining heterogeneous reliability data,” University of Dayton, Dayton, OH, March, 2012.

Warr, R.L., “Bayesian semi-Markov models for combining heterogeneous reliability data,” Joint Statistical Meeting, San Diego, CA, August, 2012.

Reviewer for *The American Statistician*, *Journal of Quality Technology*, and *International Journal of Systems Science*.

#### **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](mailto:Edward.White@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

“Earned Value Detection Modeling.” Sponsor: OSD. Funding: \$70,000 – White 60%, Pignatiello 20%, Unger 20%.

#### REFEREED JOURNAL PUBLICATIONS

Miller, T., A. Dowling, D. Youd, E. Unger, and E. White, Comparison of cumulative average to unit learning curves: a Monte Carlo approach, *Journal of Cost Analysis and Parametrics* **5** (2012), 52-61.

Keaton, C.D., E.D. White, and E.J. Unger, Using earned value data to detect potential problems in acquisition contracts, *Journal of Cost Analysis and Parametrics* **4** (2011), 148-159.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Miller, T., A. Dowling, D. Youd, E. Unger, and E. White, “Comparison of cumulative average to unit learning curves: a Monte Carlo approach,” 80th MORS Symposium, U. S. Air Force Academy, Colorado Springs, CO, June, 2012.

Jack, D.E. and E.D. White, “Contract over target baseline (OTB) effect on earned value management's cost performance index (CPI),” EVM World 28th Annual International Conference, Naples, FL, May/June, 2012

Jack, D.E. and E.D. White, “Contract over target baseline (OTB) effect on earned value management's cost performance index (CPI),” *The Measureable News* **1** (2012), 1, 13-20.

Dowling, A.W., T.P. Miller, and E.D. White, “Problem detection for DOD acquisition programs,” 45th Annual Department of Defense Cost Analysis Symposium, Williamsburg, VA, February, 2012.

#### **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 Boltzmann equations. Tel. 937-255-3636 x4272 (DSN 785-3636 x4272), email: [Aihua.Wood@afit.edu](mailto:Aihua.Wood@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

“Real-Time Combat Navigation System and Virtual Battlespace.” Sponsor: AFOSR. Funding: \$21,224.

“Distributional Direct Simulation Monte Carlo Methods.” Sponsor: AFOSR. Funding: \$42,224.

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Peterson, J. and A.W. Wood, Large solutions of non-monotone semilinear elliptic systems, *Journal of Mathematical Analysis and Applications* **384** (2011), 284-292.

Callihan, R. and A.W. Wood, Analysis of transient EM scattering from an overfilled cavity embedded in an impedance ground plane, *Applied Computational Electromagnetics Society Journal* **26** (2011), 989-996.

Schrock, C. and A.W. Wood, A distributional Monte Carlo solution technique for rarefied gas dynamics, *Journal of Thermophysics and Heat Transfer* **26** (2012), 185-189.

Schrock, C. and A.W. Wood, Convergence of a distributional Monte Carlo method for the Boltzmann equation, *Advances in Applied Mathematics and Mechanics* **4** (2012), 102-121.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Referee for *J Scientific Comp.*, *J Comp Phys*, *Statistic and Probability Letters*, *AIAA J*, and *Inverse Problems and Imaging*; Chaired session at SCPDE11, Macau, December, 2011; Organized first mathematical session (Mathematical Aspects of CEM) at the ACES 2012 Conference.

Wood, A.W., "Topics on electromagnetic scattering from cavities, a survey," Mathematics Colloquium, University of Toledo, Toledo, OH Nov., 2011.

Wood, A.W., "Helmholtz equation with impedance boundary conditions," SCPDE11, Hong Kong Baptist University, Hong Kong, China, December, 2011.

Wood, A.W., "A distributional Monte Carlo method for rarefied gas dynamics," Workshop on Scientific Computing, University of Macau, Macao, China, December, 2011.

Wood, A.W., "Recent development on the analysis of EM scattering from cavities," Applied Mathematics Seminar, Purdue University, West Lafayette, IN, March, 2012.

Wood, A.W., "Topics on EM wave propagation," CAMS, University of Nevada, Las Vegas, Las Vegas, NV, April, 2012.

Wood, A.W., "A Green's function solution of Helmholtz equation with impedance boundary conditions," ACES Annual Conference, Columbus, OH, April, 2012.

Wood, A.W., "A distributional method for the Boltzmann equation," ICNPAA 2012, Technische Universitat Wien, Vienna, Austria, April, 2012.

Wood, A.W., "Distributional Monte Carlo methods for the Boltzmann equation, a progress report," AFOSR Computational Mathematics Program Review, Washington, D. C., August, 2012.

Wood A.W., "EM scattering from cavities, a survey," ICEAA 2012, Cape Town, South Africa, September, 2012.

## **5.5. DEPARTMENT OF OPERATIONAL SCIENCES**

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### 5.5.1. DOCTORAL DISSERTATIONS

- DILLENBURGER, STEVEN P., *Minimization of Collateral Damage in Airdrops and Airstrikes*. AFIT/DS/ENS/12-01. Faculty Advisor: Dr. Jeffery K. Cochran. Sponsor: AFRL/RB. [COA]
- HARPER, TIFFANY J., *Agent Based Modeling and Simulation Framework for Supply Chain Risk Management*. AFIT/DS/ENS/12-02. Faculty Advisor: Dr. John O. Miller. Sponsor: AFGLSC. [COA]
- HARTLAGE, ROBERT B., *Rough-Cut Capacity Planning in Multimodal Freight Transportation Networks*. AFIT/DS/ENS/12-03. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: USTRANSCOM. [COA]
- JORDAN, JEREMY D., *The Average Network Flow Problem: Shortest Path and Minimum Cost Flow Formulations, Algorithms, Heuristics and Complexity*. AFIT/DS/ENS/12-09. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: USTRANSCOM. [COA]
- MINDRUP, FRANCIS M., *Optimizing Hyperspectral Imagery Anomaly Detection Algorithms through Improved Robust Parameter Design Techniques*. AFIT/DS/ENS/11-04. Faculty Advisor: Dr. Kenneth W. Bauer. Sponsor: NASIC. [COA]
- MORRIS, JAMES F., *A Quantitative Methodology for Vetting "Dark Network" Intelligence Sources for Social Network Analysis*. AFIT/DS/ENS/12-05. Faculty Advisor: Dr. Richard F. Deckro. Sponsor: NASIC.
- WILLIAMS, JASON P., *Towards the Mitigation of Correlation Effects in the Analysis of Hyperspectral Imagery with Extensions to Robust Parameter Design*. AFIT/DS/ENS/12-07. Faculty Advisor: Dr. Kenneth W. Bauer. Sponsor: N/A. [COA]

### 5.5.2. MASTER'S THESES

- BEARD, WILLIAM P., *Personnel, the Class 0 Supply Item: A Logistics Management Approach to Supplying Combatant Commanders with Warfighters*. AFIT/LSCM/ENS/12-01. Faculty Advisor: Lt Col Sharon G. Heilmann. Sponsor: N/A. [COA]
- BENGOZ, AHMET, *Using VFT as a Constraint for Goal Programming Models: A Case Study for Turkish Air Force Flying Hour Program*. AFIT/OR-MS/ENS/12-01. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: TuAF. [COA]
- BENGOZ, EMEL, *Value Focused Thinking in Developing Aerobatic Aircraft Selection Model for Turkish Air Force*. AFIT/OR-MS/ENS/12-02. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: TuAF. [COA]
- BLAKE, JASON A., *Modeling and Analysis of AF Depot Business Practices for Supply*. AFIT/OR-MS/ENS/12-03. Faculty Advisor: Dr. John O. Miller. Sponsor: AFMC/402 SCMS. [COA]
- BREITBACH, TIMOTHY W., *Afghanistan Air Cargo Routing: An Inter/Intra-Theater Approach*. AFIT/LSCM/ENS/12-02. Faculty Advisor: Dr. Alan W. Johnson. Sponsor: AMC/A9. [COA]
- BUSH, KELLY R., *Using QR Factorization for Real-Time Anomaly Detection of Hyperspectral Images*. AFIT/OR-MS/ENS/12-04. Faculty Advisor: Dr. Kenneth W. Bauer. Sponsor: NASIC. [COA]
- BUTLER, HARRIS K., *The Relationship Between Diversity and Accuracy in Multiple Classifier Systems*. AFIT/OR-MS/ENS/12-05. Faculty Advisor: Lt Col Mark A. Friend. Sponsor: N/A. [COA]
- CHAMBERLAIN, CHAD N., *Analysis of KC-46 Live-Fire Risk Mitigation Program Testing*. AFIT/OR-MS/ENS/12-06. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: OSD. [COA]

COVER, DEANE E., *A Prototype Overview for Allocating USAID Foreign Aid*. AFIT/OR-MS/ENS/12-08. Faculty Advisor: Dr. Richard F. Deckro. Sponsor: N/A.

DENNEY, DUANE M., *High Velocity Maintenance Implementation Strategies on Low Observable Aircraft*. AFIT/LSCM/ENS/12-03. Faculty Advisor: Maj Daniel D. Mattioda. Sponsor: ASC. [COA]

DISMUKES, TAMILYN S., *Surveillance Versus Reconnaissance: An Entropy Based Model*. AFIT/OR-MS/ENS/12-09. Faculty Advisor: Dr. Darryl K. Ahner. Sponsor: N/A. [COA]

FINDLEY, JONATHAN S., *A Decision Analysis Perspective on Multiple Response Robust Optimization*. AFIT/OR-MS/ENS/12-10. Faculty Advisor: Maj Matthew J. Robbins. Sponsor: AFRL/RI. [COA]

FISHER, RYAN S., *A Simulation to Evaluate Joint Military Logistics in a Humanitarian Assistance Environment*. AFIT/LSCM/ENS/12-04. Faculty Advisor: Dr. William A. Cunningham. Sponsor: USTRANSCOM. [COA]

FRIESEN, KELLY D., *Automatic Target Recognition for Hyperspectral Imagery*. AFIT/OR-MS/ENS/12-11. Faculty Advisor: Dr. Kenneth W. Bauer. Sponsor: NASIC. [COA]

GLASSBURNER, AARON V., *Evaluation of Inventory Reduction Strategies: Balad Air Base Simulation Case Study*. AFIT/LSCM/ENS/12-05. Faculty Advisor: Dr. Kenneth W. Bauer. Sponsor: AFLMA. [COA]

GUZMAN, JOSHUA D., *Analysis of Social Network Measures with Respect to Structural Properties of Networks*. AFIT/OR-MS/ENS/12-12. Faculty Advisor: Dr. Richard F. Deckro. Sponsor: NASIC.

HAINES, CHRISTOPHER B., *A Model for Reducing Uncertainty in ISR Collection Operations*. AFIT/OR-MS/ENS/12-13. Faculty Advisor: Dr. Darryl K. Ahner. Sponsor: N/A. [COA]

HUNTER, TERI M., *An Analysis of the Impact of Job Search Behaviors on Air Force Company Grade Officer Turnover*. AFIT/LSCM/ENS/12-06. Faculty Advisor: Lt Col Sharon G. Heilmann. Sponsor: N/A. [COA]

JESSUP, MEREDITH A., II, *Using Hybrid Simulation/Analytical Queuing Networks to Capacitate USAF Air Mobility Command Passenger Terminals*. AFIT/OR-MS/ENS/12-14. Faculty Advisor: Dr. Jeffrey K. Cochran. Sponsor: USPACOM. [COA]

KALLONIATIS, CHRISTOFOROS, *Exploring the Dynamics and Modeling National Budget as a Supply Chain System: A Proposal for Reengineering the Budgeting Process and for Developing a Management Flight Simulator*. AFIT/LSCM/ENS/12-07. Faculty Advisor: Dr. William A. Cunningham. Sponsor: N/A. [COA]

KIM, JAEBUM, *Decision Analysis Using Value-Focused Thinking for Retention of Long-Term Officers in the Korean Army*. AFIT/OR-MS/ENS/12-15. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: ROKAF. [COA]

KINKLE, MARISHA T., *A Multi-Stage Optimization Model for Air Force Reserve Officer Training Corps Officer Candidate Selection*. AFIT/OR-MS/ENS/12-16. Faculty Advisor: Maj Matthew J. Robbins. Sponsor: AFROTC. [COA]

KOSLOW, MICHAEL J., *Ballistic Flash Characterization: Penetration and Back-Face Flash*. AFIT/OR-MS/ENS/12-17. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: AFMC/46 TG. [COA]

LARIMORE, JASON A., *Tanker Fuel Consolidation: Effects of Higher Fidelity Modeling on a Resilient Plan*. AFIT/LSCM/ENS/12-08. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: AMC/A9. [COA]

- LEITER, MEGAN A., *Simulation Modeling and Analysis of the Impact of Individual Mobility Augmentee Loss at the Tanker Airlift Control Center*. AFIT/OR-MS/ENS/12-18. Faculty Advisor: Dr. John O. Miller. Sponsor: AMC/618 TACC. [COA]
- LOPES, JULIO C.O., *An Application of Course Scheduling in the Brazilian Air Force*. AFIT/LSCM/ENS/12-09. Faculty Advisor: Dr. Richard F. Deckro. Sponsor: Brazilian Air Force.
- LOW, MICHAEL S., *Impact of Decision Criteria on Federal Aviation Administration Certification of Military Commercial Derivative Aircraft*. AFIT/LSCM/ENS/12-10. Faculty Advisor: Dr. Alan W. Johnson. Sponsor: AFMC/A4. [COA]
- MCWILLIAMS, MARCUS R., *Improving Knowledge of C-130 Aircraft Condition: A High Velocity Maintenance Case Study*. AFIT/LSCM/ENS/12-11. Faculty Advisor: Dr. Alan W. Johnson. Sponsor: AFMC/A4. [COA]
- MILLER, ALLEN R., *Minuteman III Cost Per Alert Hour Analysis*. AFIT/LSCM/ENS/12-12. Faculty Advisor: Dr. William A. Cunningham. Sponsor: AFNWC. [COA]
- MILLER, KARI A., *Diminishing Manufacturing Sources and Material Shortages Mitigation Strategies: A Multiple-Case Study*. AFIT/LSCM/ENS/12-13. Faculty Advisor: Maj Daniel D. Mattioda. Sponsor: ASC. [COA]
- NUNNALLY, BEAU A., *Using Multiattribute Utility Copulas in Support of UAV Search and Destroy Operations*. AFIT/OR-MS/ENS/12-20. Faculty Advisor: Maj Matthew J. Robbins. Sponsor: N/A. [COA]
- PERRY, JOHN F., II, *The Impact of Supply Chain Business Processes on Competitive Advantage and Organizational Performance*. AFIT/LSCM/ENS/12-14. Faculty Advisor: Dr. William A. Cunningham. Sponsor: AFRL/RX. [COA]
- PEYTON, DAVID J., *Ballistic Flash Characterization of Entry-Side Flash*. AFIT/OR-MS/ENS/12-21. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: AFMC/46 TG. [COA]
- RIAZ, MUHAMMAD S., *Value Focused Thinking for Nation Building in Afghanistan: A Regional Perspective*. AFIT/OR-MS/ENS/12-22. Faculty Advisor: Dr. Richard F. Deckro. Sponsor: N/A.
- RUBINO, DEREK P., *A Multiple-Case Study on Department of Defense Insourcing Projects*. AFIT/GLM/ENS/12-15. Faculty Advisor: Dr. Jeffrey A. Ogden. Sponsor: ASC. [COA]
- SAIE, CADE M., *Understanding the Instruments of National Power Through a System of Differential Equations in a Counterinsurgency*. AFIT/GSE/ENS/12-01. Faculty Advisor: Dr. Darryl K. Ahner. Sponsor: CAA. [COA]
- SALAZAR, RONALD M., *The Effect of Supply Chain Management Processes on Competitive Advantage and Organizational Performance*. AFIT/LSCM/ENS/12-16. Faculty Advisor: Dr. William A. Cunningham. Sponsor: AFRL/RX. [COA]
- SAYLAM, SERHAT, *A Spreadsheet Model that Estimates the Impact of Reduced Distribution Time on Inventory Investment Savings: What is a Day Taken Out of the Pipeline Worth in Inventory?* AFIT/LSCM/ENS/12-17. Faculty Advisor: Dr. William A. Cunningham. Sponsor: TuAF & USTRANSCOM. [COA]
- SENAY, NURDINC, *The Strategic Level Optimization of Air to Ground Missiles for Turkish Air Force Decision Support System*. AFIT/OR-MS/ENS/12-23. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: TuAF. [COA]

SITU, JOHN X., *Combat Identification of Synthetic Aperture Radar Images Using Contextual Features and Bayesian Belief Networks*. AFIT/OR-MS/ENS/12-24. Faculty Advisor: Lt Col Mark A. Friend. Sponsor: N/A. [COA]

SMYTH, KEVIN B., *W78 Weapon System Supply Web: Discrete Event Simulation Modeling for Life Extension Program Planning*. AFIT/LSCM/ENS/12-18. Faculty Advisor: Dr. Alan W. Johnson. Sponsor: AFMC/498 NSW. [COA]

STAHL, GUILLERMO A., *An Evaluation of the Argentinean Basic Trainer Aircraft Domestic Development Project*. AFIT/LSCM/ENS/12-19. Faculty Advisor: Maj Daniel D. Mattioda. Sponsor: Argentine Air Force. [COA]

STORM, SCOTT M., *Evaluating Aerial Refueling Simulator Validation Test Designs by Extending Response Surface Methodology to Analyze Time History Responses*. AFIT/OR-MS/ENS/12-25. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: OSD. [COA]

TAN, HUANG TENG, *The In-Transit Vigilant Covering Tour Problem for Routing Unmanned Ground Vehicles*. AFIT/OR-MS/ENS/12-31. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: N/A. [COA]

TOPALOGLU, IHSAN, *Initial Spare Parts of the A400M Aircraft*. AFIT/LSCM/ENS/12-20. Faculty Advisor: Maj Daniel D. Mattioda. Sponsor: N/A. [COA]

UZ, VEYSEL, *CNG as a Feasible Replacement for the U.S. Transportation Sector*. AFIT/LSCM/ENS/12-21. Faculty Advisor: Lt Col Bradley E. Anderson. Sponsor: Chesapeake Energy. [COA]

WEIBLEN, JARRETT L., *The Effects of Deployments and Other Factors on Air Force Junior Officer Retention*. AFIT/LSCM/ENS/12-22. Faculty Advisor: Dr. Darryl K. Ahner. Sponsor: OSD. [COA]

WEIMER, CHRISTOPHER W., *Forecasting Effects of Influence Operations: A Generative Social Science Methodology*. AFIT/OR-MS/ENS/12-26. Faculty Advisor: Dr. John O. Miller. Sponsor: 711 HPW/RH. [COA]

WEITZ, MICHAEL T., *C-5M Super Galaxy Utilization with Joint Precision Airdrop System*. AFIT/LSCM/ENS/12-23. Faculty Advisor: Dr. Alan W. Johnson. Sponsor: AMC/A4. [COA]

WHITE, ANTHONELLI, *The Relationship Between Key Supply Chain Process Implementation, Competitive Advantage and Organizational Performance*. AFIT/LSCM/ENS/12-24. Faculty Advisor: Dr. William A. Cunningham. Sponsor: AFRL/RX. [COA]

WILLIAMS, DAVID R., *Examining EXPRESS with Simulation*. AFIT/OR-MS/ENS/12-27. Faculty Advisor: Dr. John O. Miller. Sponsor: AFGLSC. [COA]

WILLIAMS, KRISTY N., *A Benchmarking Study of Air Force Program Manager Competencies*. AFIT/OR-MS/ENS/12-28. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: AFMC/A9. [COA]

WOLF, SEAN E., *Modeling Small Unmanned Aerial System Mishaps Using Logistic Regression and Artificial Neural Networks*. AFIT/OR-MS/ENS/12-29. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: AFRL/RW. [COA]

WOODDELL, DAVID R., *Probabilistic Model for Laser Damage to the Human Retina*. AFIT/OR-MS/ENS/12-30. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: 711 HPW/RH. [COA]

YUKSELEN, KORHAN G., *An Assessment Tool of Performance Based Logistics Appropriateness*. AFIT/LSCM/ENS/12-25. Faculty Advisor: Dr. Jeffrey A. Ogden. Sponsor: TuAF. [COA]



### 5.5.3. GRADUATE RESEARCH PAPERS

- ALEXANDER, MONA E., *The C-27J Spartan Procurement Program: A Case Study in USAF Sourcing Practices for National Security*. AFIT/IMO/ENS/12-01. Faculty Advisor: Dr. Alan R. Heminger. Sponsor: HQ AMC.
- ANDERSON, SHANON E., *Employing the Management Internal Control Toolset (MICT) Across the Enterprise*. AFIT/IMO/ENS/12-02. Faculty Advisor: Dr. Jeffrey A. Ogden. Sponsor: SAF. [COA]
- BAILEY, CRAIG S., *Critical Elements and Needs for Nuclear Weapons Maintenance: A Delphi Study*. AFIT/ILS/ENS/12-01. Faculty Advisor: Dr. Alan W. Johnson. Sponsor: AFMC/A10. [COA]
- BRINE, ERIK G., *Prioritizing Foreign Military Engagements: A Multi Objective Decision Analysis Using Value Focused Thinking*. AFIT/IMO/ENS/12-03. Faculty Advisor: Dr. Stephen P. Chambal. Sponsor: SAF. [COA]
- CARMICHAEL, CHRISTOPHER L., *An Empirical Investigation of the Effectiveness of the Logistics Readiness Squadron Concept*. AFIT/IMO/ENS/12-04. Faculty Advisor: Lt Col Doral E. Sandlin. Sponsor: HQ USAF/A4. [COA]
- CARTER, CHARLES L., *Intelligence Support to Supply Chain Risk Management*. AFIT/ILS/ENS/12-02. Faculty Advisor: Maj Daniel D. Mattioda. Sponsor: AFMC/IS. [COA]
- DEYOUNG, DANIEL S., *Time Series Forecasting of Airlift Sustainment Cargo Demand*. AFIT/IMO/ENS/12-05. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: USTRANSCOM. [COA]
- DIEHL, DANIEL C., *Cost Comparison of B-1B Non-Mission-Capable Drivers Using Finite Source Queuing with Spares*. AFIT/IOA/ENS/12-01. Faculty Advisor: Dr. Jeffery K. Cochran. Sponsor: ACC. [COA]
- EHASZ, ROBERT F., *Avian Radar: Is it Worth the Cost?* AFIT/ILS/ENS/12-03. Faculty Advisor: Dr. William A. Cunningham. Sponsor: AFMC/CA. [COA]
- EPPLEY, JOEL E., *Optimizing Aircraft Utilization for Retrograde Operations*. AFIT/IMO/ENS/12-06. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: HQ AMC. [COA]
- GONYEA, TIMOTHY M., *Planes, Trains and Automobiles: Savings Potential of Utilizing Multi-Modal Transport for Depositioning Cargo in the CONUS*. AFIT/IMO/ENS/12-07. Faculty Advisor: Dr. William A. Cunningham. Sponsor: HQ AMC. [COA]
- HERVAS, DANIEL M., *Worldwide Express: Exploiting Existing Contract Provisions to Maximize Savings*. AFIT/ILS/ENS/12-04. Faculty Advisor: Dr. William A. Cunningham. Sponsor: AMC. [COA]
- LEE, JORDAN D., *The Comparison of Strategies Used in the Game of RISK via Markovian Analysis and Monte-Carlo Simulation*. AFIT/IOA/ENS/12-02. Faculty Advisor: Dr. James W. Chrissis. Sponsor: CAA & ASC. [COA]
- LINDSTROM, CRAIG D., *Examining the Value of Advanced Notification of Cargo Generation for Scheduling Channel Airlift Missions*. AFIT/IOA/ENS/12-03. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: AMC/618 TACC. [COA]
- LUECK, PETER J., *Creating Cost and Capabilities Analysis Tool for Decision Based Making within Strategic Airlift*. AFIT/IOA/ENS/12-04. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: AMC. [COA]
- LYNCH, SARAH R., *Remotely Piloted Aircraft (RPA) Performing the Air Refueling Mission*. AFIT/IMO/ENS/12-08. Faculty Advisor: Dr. Alan R. Heminger. Sponsor: HQ AMC & HQ USAF/A5.

MANUEL, FREDERICK W., *A Cost-Benefit Analysis of Purchasing More C-27J Aircraft for Direct Support*. AFIT/IMO/ENS/12-09. Faculty Advisor: Dr. William A. Cunningham. Sponsor: HQ AMC. [COA]

MIDDLETON, CHARLES J., *Risk Assessment Planning for Airborne Systems: An Information Assurance Failure Mode, Effects and Criticality Analysis Methodology*. AFIT/IOA/ENS/12-05. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: ASC. [COA]

NASMAN, JAMES M., *A Linear Regression Model Identifying the Primary Factors Contributing to Maintenance Man Hours for the C-17 Globemaster III in the Air National Guard*. AFIT/IMO/ENS/12-10. Faculty Advisor: Lt Col Shay R. Capehart. Sponsor: ANGRC.

OBERSON, FREDRIC M., *Analysis of CENTCOM Commercial Intra-Theater Airlift Costs*. AFIT/IMO/ENS/12-11. Faculty Advisor: Dr. William A. Cunningham. Sponsor: HQ AMC. [COA]

PURTLE, NATHAN R., *Modeling the 2008 Manning Study for the 618<sup>th</sup> Tanker Airlift Control Center (TACC)*. AFIT/ILS/ENS/12-05. Faculty Advisor: Dr. William A. Cunningham. Sponsor: AMC/618 TACC. [COA]

SMITH, BRIAN J., *C-17 Weapons Instructor Course: Unit Basing to Optimize Operational Efficiency and Mission Effectiveness*. AFIT/IMO/ENS/12-12. Faculty Advisor: Dr. William A. Cunningham. Sponsor: AMC/A3 & ACC/USAFWS. [COA]

STANLEY, DALE W., III, *Predicting Pilot Retention*. AFIT/IMO/ENS/12-13. Faculty Advisor: Lt Col Shay R. Capehart. Sponsor: HQ USAF/A1.

TINNEY, JODI M., *The Effects of Supply Chain Orientation, Supply Chain Management and Collaboration on Perceived Firm Performance*. AFIT/ILS/ENS/12-06. Faculty Advisor: Dr. William A. Cunningham. Sponsor: N/A. [COA]

VAIRA, BRADY J., *Estimating Bird/Aircraft Collision Probabilities and Risk Utilizing Spatial Poisson Processes*. AFIT/IOA/ENS/12-06. Faculty Advisor: Dr. Jeffery K. Cochran. Sponsor: AMC. [COA]

WHITTINGTON, JOSEPH E., JR., *Determining Mobility Support Advisory Squadron Effectiveness in Support of Building Partner Capacity*. AFIT/IMO/ENS/12-14. Faculty Advisor: Dr. Alan R. Heminger. Sponsor: AMC (USAF EC).

#### 5.5.4. FACULTY BIOGRAPHIES & RESEARCH OUTPUT

Notes: Research Center affiliations are listed in [ ] if applicable. Shared credit for funding awards is indicated by the percentages shown for each faculty member associated with the project.

##### **AHNER, DARRYL K.,**

Assistant Professor of Operations Research, Department of Operational Sciences, AFIT Appointment Date 2010; Director, Center for Operational Analysis, Appointment Date, May 2011; Director, Scientific Test and Analysis (STAT) for Test and Evaluation (T&E) Center of Excellence, Appointment Date 2012; BS, United States Military Academy, 1990; MS, Rensselaer Polytechnic Institute, 1999; MS, Rensselaer Polytechnic Institute, 1999; PhD, Boston University, 2005. Dr. Ahner's research interests 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](mailto:Darryl.Ahner@afit.edu)

##### SPONSOR FUNDED RESEARCH PROJECTS

"The 618<sup>th</sup> AOC (TACC)." Sponsor: 618 AOC. Funding: \$300,000 – Ahner 20%, Weir 20%, Cunningham 20%, Friend 20%, Miller 20%. [COA]

"Combat Analyst Course." Sponsor: HQ USAF. Funding: \$20,149. [COA]

"Test and Evaluation Center for Excellence." Sponsor: OSD. Funding: \$2,710,000. [COA]

"A System of Equations to Capture SSTRO Dynamics." Sponsor: CAA. Funding: \$400,000 – Ahner 80%, Chrissis 20%. [COA]

##### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Chair, IE in the Military Track, Industrial and Systems Engineering Research Conference, 19-21 May 2012.

Co-chair, Unmanned Systems Distributed Working Group, Military Operations Research Society Symposium, 11-14 June 2012.

Invited Panel Member and Speaker, Air Force Systems Engineering Conference, Education Panel, 16-18 August 2012. [COA]

Ahner, D., "STAT T&E COE," Invited Speaker, Air Force Test & Evaluation Policy Conference, Los Angeles Air Force Base, 24-27 April 2012. [COA]

Fundamentals of Engineering (FE) exam writer and reviewer, National Council of Examiners for Engineering and Surveying, Clemson, SC (quarterly).

Reviewer for MORS Journal (2003-present).

Ahner D., Parson C., Friend M., "Manpower Simulation, Modeling, and Analysis of the 618<sup>th</sup> Tanker Airlift Control Center," 80<sup>th</sup> MORS Symposium, Colorado Springs, June 2012. [COA]

Ahner D., Parson C., "Individual Deployer Personnel Analysis," 80<sup>th</sup> MORS Symposium, Colorado Springs, June 2012. [COA]

Ahner D., Saie C., "A System of Equations to Capture Security, Stability, Transition, and Reconstruction Operations (SSTRO) Dynamics," 80<sup>th</sup> MORS Symposium, Colorado Springs, June 2012. [COA]

Morris J., Deckro R., Ahner D., Bulutoglu D., Hamill J., "Assessing Information Networks for Social Network Analysis," 80<sup>th</sup> MORS Symposium, Colorado Springs, June 2012. [COA]

**ANDERSON, BRADLEY E., Lt Col,**

Assistant Professor of Logistics Management, Department of Operational Sciences, AFIT Appointment Dates: 2002-2009, 2011 (AFIT/ENS); 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. Lt Col Anderson's research interests include inventory management, operations management, forecasting, scheduling, energy, fuels, and inventory management, as well as evolutionary algorithms, deterministic modeling, and heuristic algorithms. Tel. 937-255-3636 x 4538 (DSN 785-3636 x4538), e-mail: [Bradley.Anderson@afit.edu](mailto:Bradley.Anderson@afit.edu)

**OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES**

Program Director, Logistics and Supply Chain Management Certificate.

**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 x4328 (DSN 785-6565 x4328), email: [Kenneth.Bauer@afit.edu](mailto:Kenneth.Bauer@afit.edu)

**SPONSOR FUNDED RESEARCH PROJECTS**

“Advanced Research in Automatic Target Recognition.” Sponsor: AFRL/RV. Funding: \$50,000. [COA]

**REFEREED JOURNAL PUBLICATIONS**

Rodriguez, J., Miller, J.O., Bauer, K.W. Jr., and F. Yee, “Mathematical Description of a Discrete Event Simulation Using Factor Analytic Method,” *Journal of the Operational Research Society*, Vol. 63, No. 9, pp. 1179-1188, Sep 2012. [COA]

Mindrup, F.M., Bauer, K.W., and M.A. Friend, “Extending Robust Parameter Design to Noise by Noise Interactions with an Application to Hyperspectral Imagery,” *International Journal of Quality Engineering & Technology*, Vol. 3, No. 1, pp. 1-19, 2012. [COA]

Mohd-Zaid, F., Bauer, K.W., and M.A. Friend, “Face Recognition via Ensemble SIFT Matching of Uncorrelated Hyperspectral Bands and Spectral PCT,” *International Journal of Tomography & Statistics*, 2012, Vol. 19, Issue No. 1, pp. 1-13. [COA]

Leap, N.J. and K.W. Bauer, “A Confidence Paradigm for Classification Systems with Out-of-Library Considerations,” *Intelligent Decision Technologies*, Vol. 6, No. 1, 2012, pp. 1-25. [COA]

T. Dube, R. Raines, G. Peterson, K. Bauer, M. Grimaila and S. Rogers, “Malware Target Recognition via Static Heuristics,” *Computers and Security*, Vol. 31, Issue 1, February 2012, pp. 137-147. [COA]

Loeffelholz, B.J. and Bauer, K.W., “A gradient-based method to guard against system degradation in robust parameter design,” *International Journal of Quality Engineering and Technology*, Vol. 2, No. 4, pp. 277–290 (2011). [COA]

Caulk, R.F., Reyes, K.B., and K.W. Bauer, “Outlier Detection in Hyperspectral Imagery using Closest Distance to Center with Ellipsoidal Multivariate Trimming,” *The Journal of Defense Modeling and Simulation: Applications, Methodology, Technology*, April 2012, Vol. 9, No. 2, pp. 163-172. [COA]

**OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES**

Program Director, Operations Research Doctoral Program, Department of Operational Sciences.

Reviewer, Institute of Electrical and Electronics Engineers (IEEE).

Mindrup, F.M., Bauer, K.W., and M.A. Friend, "Extending robust parameter design to noise by noise interactions," 80th MORS Symposium, United States Coast Guard Academy, Colorado Springs, Colorado, 11-14 June 2012. [COA]

Mohd-Zaid, F., Bauer, K.W., and Friend, M.A. (June 2012). Face recognition via ensemble SIFT matching of uncorrelated hyperspectral bands and spectral PCTs. Military Operations Research Society Symposium. Colorado Springs, CO. [COA]

Mohd-Zaid, F., Bauer, K.W., and Friend, M.A. (October 2011). Face recognition via ensemble SIFT matching of uncorrelated hyperspectral bands and spectral PCTs. United States Air Force Analyses, Assessments, and Lessons Learned Symposium 2011. Dayton, OH. [COA]

Friesen, K.D., Bihl, T.J., Bauer, K.W., Friend, M.A., and Williams, J.P. "Automatic Target Recognition for Hyperspectral Imagery," 80th MORS Symposium, United States Air Force Academy, CO, 2012. [COA]

**BURNS, KEVIN E., Col,**

Assistant Professor of Operations Research, Department of Operational Sciences, AFIT Appointment Date: 2009 (AFIT/ENS); Senior Military Faculty and Associate Dean Graduate School of Engineering and Management; BS, Mathematical Sciences, US Air Force Academy, 1988; MS, Mathematics, University of North Carolina, 1993; PhD, Operations Research, 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- 3025 (DSN 785-3025), email: [Kevin.Burns@afit.edu](mailto:Kevin.Burns@afit.edu)

**CHRISSIS, JAMES W.,**

Associate Professor of Operations Research, Department of Operational Sciences, AFIT Appointment Date: 1987 (AFIT/ENS); BS, University of Pittsburgh, 1975; MS, Virginia Polytechnic Institute and State University, 1977; PhD, Virginia Polytechnic Institute and State University, 1980. Dr. Chrissis' research interests include engineering optimization, mathematical programming, simulation, stochastic systems, and industrial engineering. Dr. Chrissis has been a member of the faculties of Virginia Tech and the University of South Florida. He is a member of the Institute for Operations Research and Management Sciences (INFORMS), The Society for Industrial and Applied Mathematics (SIAM), the Military Operations Research Society (MORS), The American Institute for Aeronautics and Astronautics (AIAA), and Sigma Xi. Tel. 937-255-3636 x4606 (DSN 785-3636 x4606), email: [James.Chrissis@afit.edu](mailto:James.Chrissis@afit.edu)

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

J. Lee, J. Chrissis and M. Garrambone, "Analyzing Military Strategies via a Stochastic Wargame," IIE International Conference, Orlando, FL, May 2012. [COA]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

"Linear and Nonlinear Programming," 80<sup>th</sup> MORSS Tutorial, Colorado Springs, CO, 11 June 2012. [COA]

General Chair, 14<sup>th</sup> AIAA/ISSMO Multidisciplinary Analysis and Optimization Conference, Indianapolis, IN, Sept 2012.

AIAA Multidisciplinary Design Optimization (MDO) Technical Committee (TC) Secretary.

Reviewed papers submitted for the April 2012 AIAA SDM Conference/MDO Specialist Conference in Honolulu, HI.

Reviewer, *European Journal of Operational Research*.

Reviewer, *Simulation*.

**COCHRAN, JEFFERY K.,**

Professor of Operations Research, Department of Operational Sciences, AFIT Appointment Date: 2007 (AFIT/ENS); BSE, Purdue University, 1973; MSNE, Purdue University, 1976; MSIE, Purdue University, 1982; PhD, Purdue University, 1984. Dr. Cochran's research interests include applied probability, queuing and queuing networks, and heuristic optimization of stochastic models particularly in high technology entity flow systems. Tel. 937-255-3636 x4521 (DSN 785-3636 x4521), email: [Jeffery.Cochran@afit.edu](mailto:Jeffery.Cochran@afit.edu)

**REFEREED JOURNAL PUBLICATIONS**

Broyles, J.R., Cochran, J.K., and Montgomery, D.C., "A Markov Decision Process to Dynamically Match Hospital Inpatient Staffing to Demand," *IIE Transactions on Healthcare Systems Engineering* 1:2, pp. 116-130 (Oct 2011). [COA]

Holzmann, T.W. and Cochran, J.K., "A Stochastic Model to Estimate Joint Fire Fratricide," *Military Operations Research* 17:2, pp. 1-16 (June 2012). [COA]

Roche, K.T., Rivera, D.E. and Cochran, J.K., "Control Engineering Framework for Managing Whole Hospital Occupancy," *Mathematical and Computer Modeling* 55:3-4, pp. 1401-1417 (Feb 2012). [COA]

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

Broyles, J.R. and Cochran, J.K., "Queuing-based Regression Approximation of Hospital Emergency Department Boarding," International Conference on Computers and Industrial Engineering, 6 pages on CD-ROM, Los Angeles, CA (Oct 2011). [COA]

**OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES**

Editorial Board, *International Journal of Mathematics in Operational Research*, *International Journal of Industrial and Systems Engineering*, *International Journal of Simulation and Process Modeling*, *Journal of Design and Manufacturing Automation*, *Computers in Industry*.

Senior Member of the Institute of Industrial Engineers.

Senior Member of the Society for Computer Simulation.

Member of American Society for Engineering Education.

Session Chair at 41<sup>st</sup> Annual Computers and Industrial Engineering Conference, Los Angeles, CA (2011).

**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](mailto:William.Cunningham@afit.edu)

**REFEREED JOURNAL PUBLICATIONS**

Ryan Rowe, William Cunningham, "Optimal CV-22 Centralized Intermediate Repair Facility Locations and Parts Repair," *Air Force Journal of Logistics*, Vol. XXXV, Nos. 3 and 4, pp. 40-49. [COA]

Bryan Main, William Cunningham, Daniel Mattioda, "Analytical Techniques and the Air Force Logistics Readiness Officer," *Journal of Transportation Management*, Vol. 21, No. 2A, Fall 2010, pp. 33-47. [COA]

Adam Reiman, Alan Johnson, William Cunningham, "Competitive Advantage and Fuel Efficiency in Aviation," *Journal of Transportation Management*, Vol. 22, No. 2, Fall/Winter 2011, pp. 75-91. [COA]

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

John Bell, William Cunningham, Joseph Skipper, and Dain Kleiv, "Resource Consolidation and Location Decision Making for Damaged and Disabled Aircraft Recovery," Western Decision Sciences Institute annual Meeting, Hilton Waikoloa Village, Big Island, Hawaii, April 3-6, 2012. [COA]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Program Director, Master of Science in Logistics and Supply Chain Management, Department of Operational Sciences.

Editorial Review Board, *Journal of Transportation Management*.

Editorial Review Board, *Journal of Air Force Logistics*.

Book reviewer, *Army Logistician*.

Examiner for Transportation and Economics Module for Certified Transportation and Logistics (CTL) certification for American Society of Transportation and Logistics (AST&L).

Reviewer for Western Decision Science Institute.

#### **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](mailto:Richard.Deckro@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

"Developing an MOA with the Joint Warfare Analysis Center." Sponsor: JWAC. Funding \$85,000.

#### REFEREED JOURNAL PUBLICATIONS

Kevin T. Kennedy, Richard F. Deckro, James T. Moore, and Kenneth M. Hopkinson, "Nodal Interdiction," *Mathematical and Computer Modeling*, Volume 54, Issues 11-12, December 2011, pp. 3116-3125.

#### BOOKS AND CHAPTERS IN BOOKS

B. Jacob Loeffelholz, Richard F. Deckro, and Shane A. Knighton, "Street Gangs: A Modeling Approach for Evaluating 'At Risk' Youth and Communities," *Community-Based Operations Research: Decision Modeling for Local Impact and Diverse Populations*, edited by Michael P. Johnson, Springer. International Series in Operations Research & Management Science, 2012, Volume 167, Part 3, Chapter 9, pp. 213-249.

## OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Editor, *Military Operations Research*.

Peer reviewer for 7 journals.

Advisory Director, MORS; Member, MORS Publication Committee, MORS Heritage Committee.

Member, Peacekeeping and Stability Operations Institute Academic Consortium.

Judge for the US Army's 2011 Dr. Wilbur B. Payne Memorial Award for Excellence in Analysis.

Organized and chaired a MAS sponsored session for the National INFORMS meeting in Charlotte, NC entitled *Social Network Analysis in National Security Studies*.

Served as an Air Force representative on the 2012 Evaluation Panel for the Science, Mathematics & Research Transformation (SMART) program.

MORS 2012 Rist Prize Abstract Judge. (Preliminary round evaluated on abstracts to determine finalist to be presented at the annual meeting.)

Judge for the Homeland Security Track Best Paper selection for *The Industrial and Systems Engineering Research Conference 2012*.

Organized and chaired a session for the Industrial and Systems Engineering Research Conference 2012 in Orlando, FL entitled *Approaches to Homeland Defense and Security*.

James F. Morris, Richard F. Deckro, Darryl Ahner, Dursun Bulutoglu, and Jonathan Hamill, "Statistical Analysis of Social Network Analysis Methodologies with Design of Experiments and Quantile Regression", The 29<sup>th</sup> International Military Operational Research Symposium, New Place, Shirrell Heath, Southampton, UK, August 2012.

James F. Morris, Richard F. Deckro, Darryl Ahner, Dursun Bulutoglu, and Jonathan Hamill, "Assessing Information Sources for Social Network Analysis," 80<sup>th</sup> MORS Symposium, Colorado Springs, June 2012.

James F. Morris and Richard F. Deckro, "Imperfect Data in Social Network Analysis," *INFORMS Charlotte*, November 2011.

Lt Joshua Guzman, Richard F. Deckro, James F. Morris, Jerome W. O'Neal and Nicholas Ballester *Data Sets for Social Network Analysis*, FOIL Technical Report 12-01, March 2012.

## **FRIEND, MARK A., Lt Col,**

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](mailto:Mark.Friend@afit.edu)

## REFEREED JOURNAL PUBLICATIONS

Mindrup, F. M. , Bauer, K. W., and M. A. Friend, "Extending Robust Parameter Design to Noise by Noise Interactions with an Application to Hyperspectral Imagery," *International Journal of Quality Engineering & Technology*, Vol. 3, No. 1, pp. 1-19 (2012). [COA]



Mohd-Zaid, F., Bauer, K.W., and M.A. Friend, "Face Recognition via Ensemble SIFT Matching of Uncorrelated Hyperspectral Bands and Spectral PCT," *International Journal of Tomography & Statistics*, 2012, Volume 19, Issue Number 1, pp. 1-13. [COA]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Reviewer, *Journal of Defense Modeling and Simulation, Military Operations Research, IEEE Transactions on Nuclear Science*.

Vice President, Cincinnati-Dayton Chapter of INFORMS.

Secretary, Cincinnati-Dayton Chapter of INFORMS.

Ahner D., Parson C., Friend M., "Manpower Simulation, Modeling, and Analysis of the 618<sup>th</sup> Tanker Airlift Control Center," 80<sup>th</sup> MORS Symposium, Colorado Springs, CO., June 2012. [COA]

Situ J, Friend M., "Combat Identification of Synthetic Aperture Radar Images using Contextual Features and Bayesian Belief Networks," 80<sup>th</sup> MORS Symposium, Colorado Springs, CO., June 2012. [COA]

Friend, M., Racz, L., "Keeping Graduate Education Relevant: Tying the Operational Air Force to the Classroom," Air Education and Training Command Symposium, San Antonio, TX., Jan 2012. [COA]

#### **GEFFRE, JENNIFER L., Capt,**

Instructor of Operations Research, Department of Operational Sciences, AFIT Appointment Date: 2012 (ENS); BS, Mathematics, Colorado State University; MS, Operations Research, Air Force Institute of Technology, 2007. Captain Geffre's research interests include: risk/threat analysis and management, decision analysis (especially strategic decision making), information operations and intelligence problems, influence and social network models, network optimization, data mining, and multivariate analysis. Tel 937-255-3636 x4646, (DSN 785-3636 x 4646), e-mail: [Jennifer.Geffre@afit.edu](mailto:Jennifer.Geffre@afit.edu)

#### **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), Deputy Department Head; 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](mailto:Sharon.Heilmann@afit.edu)

#### REFEREED JOURNAL PUBLICATIONS

Heilmann, S. G. (2012). "Can You Hear Me Now? Enhancing Students' Classroom Communication Preferences via a Telephone Conference Activity," *Journal of Educators Online*, 9(1). [COA]

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

Morissette, G., Thal, A.E., and Heilmann, S.G. (2012). "Developing a Predictive Model for United States Air Force Facility Repair Costs," Western Decision Science Institute, Big Island, HI, 3-6 April 2012. [COA]

Heilmann, S.G., Bartczak, S, E., Hobbs, S., and Leach, S. "Assessing Influences on Perceived Training Transfer: If I Only Knew then What I Need to Know Now," Midwest Academy of Management, Omaha, NE, 20-22 Oct 2011. [COA]

Heilmann, S.G., and Low, M.S. (2011). "An Application of Bloom's Taxonomy in a Graduate Organizational Behavior Course: A Multi-media Portfolio Project," Ohio Teaching & Learning Conference: High Impact Learning in a Time of Change, Dayton, OH, 27 Oct 2011. [COA]

## OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Reviewer, *Human Resource Management Journal*.

Reviewer, 2012, Academy of Management Annual Conference, Boston, MA, Organizational Behavior Division.

Reviewer, 2012, Midwest Academy of Management. Reviewed 3 papers for Organizational Behavior Division.

Ahner, D.K., Heilmann, S.G., & Parson, C. P. (2012). "Individual Deployer Personnel Analysis," Report presented to Office of the Secretary of Defense, Personnel & Readiness. COA-Report-01-2012. [COA]

### **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](mailto:Raymond.Hill@afit.edu)

## SPONSOR FUNDED RESEARCH PROJECTS

"The Science of Test: Advanced Test and Evaluation in Support of the DOD Test and Evaluation Enterprise." Sponsor: OSD. Funding: \$680,637. [COA]

"Force Structure Analysis Tool Development." Sponsor: AF/A9. Funding: \$80,991. [COA]

## REFEREED JOURNAL PUBLICATIONS

Meador, D. P. and R. R. Hill. 2011. "Modeling Training Effects Using a Human Performance Taxonomy," *Human Factors* Vol. 53, No. 4, 391-402. [COA]

Haase, C. L., R. R. Hill, and D. Hodson. 2011. "Using Statistical Experimental Design to Realize LVC Potential in T&E," *International Test and Evaluation Journal*, Vol. 32, No. 3, 288-297. [COA]

Hill, R. R., D. A. Leggio, S. R. Capehart, A. G. Roesener. 2011. "Examining Improved Experimental Designs for Wind Tunnel Testing using Monte Carlo Sampling Methods," *Quality and Reliability Engineering International*, Vol. 27, Issue 6, 795-803. [COA]

Haase, C. L., and R. R. Hill. 2011. "An Algorithmic Foldover Procedure for Nearly Orthogonal Arrays with Projection," *Journal of Experimental Design and Process Optimization*, Vol. 2, No. 3, 191-201. [COA]

MacKenzie, A., J. O. Miller, R. R. Hill, and S. P. Chambal. 2012. "Application of Agent Based Modeling to Aircraft Maintenance Manning and Sortie Generation," *Simulation Modeling Practice and Theory*, Vol. 20, 89-98. [COA]

Hill, R. R., Y. K. Cho, and J. T. Moore. 2012. "Problem Reduction Heuristic for the 0-1 Multidimensional Knapsack Problem," *Computers & Operations Research*, Vol. 39, Issue 1, pp. 19-26. [COA]

Hill, R. R., J. T. Moore, C. Hiremath and Y. K. Cho. June 2012. "Test Problem Generation of Binary Knapsack Problem Variants and the Implications of their Use," *International Journal of Operations and Quantitative Management*, Vol. 18, No. 2, pp. 105-128. [COA]

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

Harper, T. J., Miller, J. O., Hill, R. R., and J. R. Wirthlin. December 2011. "Agent Based Simulation Design for Aggregation and Disaggregation," *Proceedings of the 2011 Winter Simulation Conference*, ed. S. Jain, R. R. Creasey, J. Himmelspace, K. P. White and M. Fu. IEEE, Piscataway, NJ. 259-270. [COA]

Hill, R. R., D. Mattioda and R. Garza. December 2011. "A Simulation Based Analysis of the B-1B's AN/ALQ-161 Maintenance Process," *Proceedings of the 2011 Winter Simulation Conference*, ed. S. Jain, R. R. Creasey, J. Himmelspace, K. P. White and M. Fu. IEEE, Piscataway, NJ. 2552-2563. [COA]

Wolf, S, J. J. Pignatiello, R. R. Hill. May 2012. "A Magnitude Robust Control Chart for Monitoring Process Dispersion," *Proceedings of the 2012 Industrial and Systems Engineering Research*, Orlando, FL. [COA]

Mattioda, D., R. Hill, R. Garza. April 2012. "Air Force Hierarchical Maintenance Structure: Discrete Event Simulation," *Proceedings of the Forty First Annual Meeting of the Western Decision Sciences Institute*, Waikoloa Village, Hawaii. [COA]

Wooddell, D. A., C. M. Schubert Kabban, R. R. Hill. January 2012. "An Analysis of the Influences of Biological Variance, Measurement Error, and Uncertainty on Retinal Photothermal Damage Threshold Studies," *Proceedings of International Society for Optics and Photonics*, 2012 Photonics West Conference, San Francisco, CA. [COA]

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

"Advancing Statistical Methods for Examining Flight Test Performance Data," with J. J. Pignatiello, Jr. and S. Storm. Defense Analysis Seminar XVI, Seoul, South Korea, 23-25 April 2012. [COA]

"Using LVC Simulations for Systems Analysis – Experimental and Software Design Issues," with D. Hodson and A. Gutman. Defense Analysis Seminar XVI, Seoul, South Korea, 23-25 April 2012. [COA]

"Developing and Validating an Empirical Model of Missile Fragment Flash Characterization," *Quality and Productivity Research Conference*, Long Beach CA, June 2012. [COA]

"Developing and Validating an Empirical Model of Missile Fragment Flash Characterization," with D. P. Peyton, M. Koslow and C. Chamberlain, 80<sup>th</sup> Military Operations Research Society Symposium, United States Air Force Academy, Colorado Springs, CO, June 2012 (presented by Capt Brian Stone based on scripted brief provided). [COA]

"Using LVC Simulations for Systems Analysis – Experimental and Software Design Issues," with D. Hodson and A. Gutman. 80<sup>th</sup> Military Operations Research Society Symposium, United States Air Force Academy, Colorado Springs, CO, June 2012. [COA]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Program Chair, Test and Evaluation Certificate, Department of Operational Sciences.

Chair, AFIT Graduate School Promotion and Tenure Committee.

Associate Editor, *Naval Research Logistics*, *Military Operations Research*, *Journal of Defense Modeling and Simulation*, *Journal of Simulation*, *International Journal of Mathematics in Operations Research*.

2012 Winter Simulation Conference Associate General Chair.

2011 Winter Simulation Conference Session Chair (Military Track and Agent Modeling Track).

Reviewer, *Military Operations Research, Naval Research Logistics, Journal of Defense Modeling and Simulation, Journal of Simulation, European Journal of Operations Research, Computers & Operations Research*.

Session Chair, Logistics and Mobility Session, 2011 Winter Simulation Conference, Phoenix AZ, December 2011.

Session Chair, Test & Evaluation Track, Session II, Air Force Analyses, Assessments and Lessons Learned Symposium, Dayton OH, 24-27 October 2011.

“Acquisition and Testing, DT/OT Testing: The Need for Two Parameter Requirements,” presented with Alex Gutman at the Air Force Analyses, Assessments and Lessons Learned Symposium, Dayton OH, 24-27 October 2011. [COA]

“Ballistic Impact Flash Modeling,” presented at the Air Force Analyses, Assessments and Lessons Learned Symposium, Dayton OH, 24-27 October 2011. [COA]

“Advanced Design of Experiments Tutorial,” presented at the Air Force Analyses, Assessments and Lessons Learned Symposium, Dayton OH, 24-27 October 2011. [COA]

“Advancing Statistical Methods for Examining Flight Test Performance Data,” with J. J. Pignatiello, Jr. and S. Storm. Defense Analysis Seminar XVI, Seoul, South Korea, 23-25 April 2012. [COA]

“Advancing the Science of Test in the Department of Defense,” presented to the graduate program in Industrial Engineering at Clemson University as part of their invited lecture series, 1 Oct 2011. [COA]

#### **HUSCROFT, JOSEPH R., Lt Col,**

Assistant Professor of Logistics and Supply Chain Management, Department of Operational Sciences, AFIT  
Appointment date: 2012 (AFIT/ENS); BS, Behavioral Science, United States Air Force Academy, 1994;  
Master of Public Administration, Troy State University, 2002; MS, Logistics Management, Air Force Institute of Technology, 2004; PhD, Management, Auburn University, 2010. Lt Col Huscroft’s research interests include supply chain management, reverse logistics, reverse logistics metrics, innovation and flexibility in the supply chain, operations management, information systems impact on the supply chain, transportation and distribution. Tel. 937-255-3636 x 4533 (DSN 785-3636 x4533), e-mail [Joseph.Huscroft@afit.edu](mailto:Joseph.Huscroft@afit.edu)

#### **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](mailto:Alan.Johnson@afit.edu)

#### **SPONSOR FUNDED RESEARCH PROJECTS**

“Research Analysis and Transition Support to the Director of Logistics and Sustainment.” Sponsor: AFMC.  
Funding: \$375,000. [COA]

#### **REFEREED JOURNAL PUBLICATIONS**

Guler, C., Johnson, A., and Cooper, M., 2012, “Case Study: Energy Industry Economic Impacts from Ohio River Transportation Disruption,” *Engineering Economist* 57(2): 77-100. [COA]

Reiman, A., Johnson, A., and Cunningham, W., 2011, "Competitive Advantage and Fuel Efficiency in Aviation," *Journal of Transportation Management* 22(2): 75-91. [COA]

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

Chua, M., Ogden, J. and Johnson, A., "Simulating the Expeditionary Combat Support System Help Desk," *Proceedings of the April, 2012 Western Decision Sciences Institute Conference*, Waikoloa, HI. [COA]

Ysebaert, S., Johnson, A., Miller, J., and Pettit, T., "An Analytical Approach to Low Observable Maintenance Practices Using Simulation and Marginal Analysis," *Proceedings of the 2011 Winter Simulation Conference*, Phoenix AZ, 11-14 Dec 2011. [COA]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Program Director, Logistics Doctoral Program, Department of Operational Sciences.

Associate Editor, *IIE Transactions*.

Editorial Board, *International Journal of Operations Research and Information Systems (IJORIS)*.

Reviewer, *European Journal of Operational Research*.

Reviewer, *Military Operations Research*.

Reviewer, AIAA Space Logistics Technical Committee (awards committee).

Session Chair, INFORMS National Meeting, 13-16 Nov 2011, Charlotte, NC.

INFORMS National Meeting, 13-16 November 2011, Charlotte, NC (F. Cardoso and A. Johnson), "Stealthy River Navigation in Jungle Combat Conditions." [COA]

INFORMS National Meeting, 13-16 November 2011, Charlotte, NC (S. Linck and A. Johnson), "Tanker Aircraft Consolidation versus Air Task Order Resiliency." [COA]

#### **MATTIODA, DANIEL D., Maj,**

Assistant Professor of Logistics Management and Supply Chain Management, Department of Operational Sciences, AFIT Appointment Date: 2007-2010, 2011 (AFIT/ENS); Chief, Logistics Division; 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. Tel. 937-255-3636x4510 (DSN 785-3636x4510), email: [Daniel.Mattioda@afit.edu](mailto:Daniel.Mattioda@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

"Research Analysis and Transition Support to the 478<sup>th</sup> Aeronautical Systems Group." Sponsor: 478 AESG. Funding: \$785,000 – Mattioda 40%, Ogden 15%, Hill 15%, Sandlin 15%, Randall 15%. [COA]

#### REFEREED JOURNAL PUBLICATIONS

Main, B., W. Cunningham, and D. Mattioda, "Analytical Techniques and the Air Force Logistics Readiness Officer," *Journal of Transportation Management*, Vol. 21, No. 2A, Fall 2010, pp. 33-47. [COA]

Morrison, P. and D. Mattioda (2011), "Reballasting the KC-135 Fleet for Fuel Efficiency," *Military Operations Research*, Vol. 16, No. 3, pp. 49-64. [COA]

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

Hill, R., D. Mattioda and R. Garza. December 2011. "A Simulation Based Analysis of the B-1B's AN/ALQ-161 Maintenance Process," *Proceedings of the 2011 Winter Simulation Conference*, ed. S. Jain, R. R. Creasey, J. Himmelspace, K. P. White and M. Fu. IEEE, Piscataway, NJ, pp. 2552-2563. [COA]

Mattioda, D., R. Hill and R. Garza. April 2012, "Air Force Hierarchical Maintenance Structure: Discrete Even Simulation," *Proceedings of the Forty First Annual Meeting of the Western Decision Sciences Institute*, Waikoloa Village, Hawaii. [COA]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Program Director, Master of Science in Logistics (ASAM), Department of Operational Sciences.

Reviewer, 2012 Council of Supply Chain Management Professional (CSCMP) Educator's Conference Dissertation.

#### **MILLER, JOHN O.,**

Associate Professor of Operations Research, Department of Operational Sciences, AFIT Appointment Date: 2002 (AFIT/ENS); 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](mailto:John.Miller@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

"Research, Analysis and Transition Support to the Air Force Global Logistics Support Center." Sponsor: AFLGLSC. Funding: \$250,000. [COA]

#### REFEREED JOURNAL PUBLICATIONS

Rodriguez, J., Miller, J.O., Bauer, K.W. Jr., and Yee, F., "Mathematical Description of a Discrete Event Simulation Using Factor Analytic Method," *Journal of the Operational Research Society*, Vol. 63 No. 9, pp. 1179-1188, Sep 2012. [COA]

MacKenzie, A., Miller, J.O., Hill, R.R., and Chambal, S.P., "Application of Agent Based Modeling to Aircraft Maintenance Manning and Sortie Generation," *Simulation Modelling Practice and Theory*, Vol. 20 No. 1, pp. 89-98, Jan 2012. [COA]

Parson, C.R., Miller, J.O., Weir, J.D., "Simulation and Analysis of Mission Capability Degrades due to Supply for the B-1 Bomber," *The Journal of Defense Modeling and Simulation: Applications, Methodology, Technology*, July 2012, Vol. 9, No. 3. pp. 279-290. [COA]

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

Harper, T. J., Miller, J. O., Hill, R. R., and J. R. Wirthlin. December 2011. "Agent Based Simulation Design for Aggregation and Disaggregation," *Proceedings of the 2011 Winter Simulation Conference*, ed. S. Jain, R. R. Creasey, J. Himmelspace, K. P. White and M. Fu. IEEE, Piscataway, NJ, pp. 259-270. [COA]

Ysebaert, S., Johnson, A., Miller, J., and Pettit, T., "An Analytical Approach to Low Observable Maintenance Practices Using Simulation and Marginal Analysis," *Proceedings of the 2011 Winter Simulation Conference*, Phoenix AZ, 11-14 Dec 2011. [COA]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Program Director, Master of Science in Operations Research, Department of Operational Sciences.

Associate Editor, *International Journal of Operations Research*.

Journal referee, *Military Operations Research*, *International Journal of Logistics: Research and Applications*, *The Journal of Defense Modeling and Simulation*.

Chair, Combat Modeling session in simulation track at Midwest INFORMS, The Ohio State University, 1- 2 Aug 2012.

Miller, J.O., Parson, C.R., and Park, A. "Simulation and Analysis of Maintenance and Supply Processes for the B-1 Strategic Bomber," Midwest INFORMS Conference, The Ohio State University, 1- 2 Aug 2012. [COA]

Miller, J.O. "Some AFIT Constructive Combat Simulations," Midwest INFORMS Conference, The Ohio State University, 1- 2 Aug 2012. [COA]

#### **MOORE, JAMES T.,**

Professor of Operations Research, Department of Operational Sciences, AFIT Appointment Dates: 1990-1998, 1998-2011 (AFIT/ENS); Head, Department of Operational Sciences, 1 Jan-15 Nov 2011; 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.

#### REFEREED JOURNAL PUBLICATIONS

Kevin T. Kennedy, Richard F. Deckro, James T. Moore, and Kenneth M. Hopkinson, "Nodal Interdiction," *Mathematical and Computer Modeling*, Volume 54, Issues 11-12, December 2011, pp. 3116-3125. [COA]

Compton, M.D., Hopkinson, K.M., Peterson, G.L., and Moore, J.T. "Using Modeling and Simulation to Examine the Benefits of a Network Tasking Order," *The Journal of Defense Modeling and Simulation: Applications, Methodology, Technology* 9:3, pp. 205-217 (2012). [COA]

Hill, R. R., Y. K. Cho, and J. T. Moore. 2012. "Problem Reduction Heuristic for the 0-1 Multidimensional Knapsack Problem," *Computers & Operations Research*, Vol. 39, Issue 1, pp. 19-26. [COA]

Hill, R. R., J. T. Moore, C. Hiremath and Y. K. Cho. June 2012. "Test Problem Generation of Binary Knapsack Problem Variants and the Implications of their Use," *International Journal of Operations and Quantitative Management*, Vol. 18, No. 2, pp. 105-128. [COA]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Editorial Board member, *Military Operations Research*.

#### **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](mailto:Jeffrey.Ogden@afit.edu)

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

Chua, M., Ogden, J. and Johnson, A., "Simulating the Expeditionary Combat Support System Help Desk," *Proceedings of the April, 2012 Western Decision Sciences Institute Conference*, Waikoloa, HI. [COA]

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

Hartman, P.L. and Ogden, J.A. (2012) "The Insourcing Cycle Shift: Applying the Triple Helix Model to Analyze the Effects of Multi-Dimensional Influential Factors on the Purchasing Function," 22<sup>nd</sup> Annual North American Research Symposium on Purchasing and Supply Chain Management, Tempe, Arizona, March 2012. [COA]

Underwood, K.D., McConville, M. and Ogden, J.A. (2012) "Comparing Sourcing Strategies in the Face of Electronic Component Obsolescence," 22<sup>nd</sup> Annual North American Research Symposium on Purchasing and Supply Chain Management, Tempe, Arizona, March 2012. [COA]

Chalyvidis, C., Morrow, D., Johnson, A. and Ogden, J.A. (2012) "Supply Chain Interoperability: A Framework," 22<sup>nd</sup> Annual North American Research Symposium on Purchasing and Supply Chain Management, Tempe, Arizona, March 2012. [COA]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Program Chair (part-year), MS in Logistics (ASAM), Department of Operational Sciences.

AFIT Graduate School Chairman, Curriculum Development Review Committee.

Reviewer, *International Journal of Production Economics*, *Journal of Supply Chain Management*, *International Journal of Operations & Production Management*, *Supply Chain Forum: An International Journal*. [COA]

Reviewed papers for ISM's 2012 North American Research Symposium.

#### **PIGNATIELLO, JOSEPH J.,**

Professor of Operations Research, Department of Operational Sciences; Head, Department of Operational Sciences, AFIT Date: 2010-2011 (AFIT/ENV), 2011 (AFIT/ENS); BS, Mathematics, University of Massachusetts; MS, Industrial and Systems Engineering, The Ohio State University, 1979; PhD, Industrial and Systems Engineering, The Ohio State University, 1982. Dr. Pignatiello's research interests include statistical process monitoring, change-point models, design and analysis of experiments, reliability, statistical data analysis, robust design, and six sigma methods. Dr. Pignatiello is a Fellow of the American Society for Quality, a senior member of the Institute of Industrial Engineers, and a member of the Institute for Operations Research and Management Science. Tel. 937-255-3636 x4311 (DSN 785-3636 x 4311; email [Joseph.Pignatiello@afit.edu](mailto:Joseph.Pignatiello@afit.edu))

#### REFEREED JOURNAL PUBLICATIONS

Perry, Marcus B. and Pignatiello, Joseph J., Jr., "Identifying the Time of Change in a Normal Process Mean with Two-Stage Nested Samples," *Journal of Applied Statistics*, Vol. 39, No. 2, pp. 419-433, 2012. [COA]

Perry, Marcus B. and Pignatiello, Joseph J., Jr., "Estimating the Time of Step Change with Poisson CUSUM and EWMA Control Charts," *International Journal of Production Research*, Vol. 49, No. 10, pp. 2857-2871, 2011. [COA]

Perry, Marcus B., Mercado, Gary R. and Pignatiello, Joseph J., Jr., "Phase II Monitoring of Covariance Stationary Autocorrelated Processes," *Quality and Reliability Engineering International*, Vol. 27, pp. 35-45, 2011. [COA]



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

Pignatiello, Joseph J., Jr., Hill, Raymond R. and Wolf, Sean E., “A Magnitude Robust Control Chart for Monitoring Process Dispersion – II,” Proceedings of the Industrial and Systems Engineering Research Conference, Orlando, FL, May 20-24, 2012. [COA]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Editorial Board, *Quality Engineering*.

Editorial Board, *IIE Transactions*.

Editorial Advisory Board, *International Journal of Six Sigma and Competitive Advantage*.

Editorial Advisory Board, *International Journal of Lean Six Sigma*.

Journal Referee, *IIE Transactions*, *Journal of Quality Technology*, *Quality Engineering*, *Quality and Reliability Engineering International*, *Journal of Nonparametric Statistics*.

Co-Chair, Quality and Reliability Engineering Track, Industrial and Systems Engineering Conference, 2012.

President-Elect, Quality and Reliability Engineering Division, Institute of Industrial Engineers, 2012.

Moderator, Statistical Process Control I, Industrial and Systems Engineering Conference, Orlando, FL, May 20-24, 2012.

“Advancing Statistical Methods for Examining Flight Test Performance Data,” with R. Hill and S. Storm. Defense Analysis Seminar XVI, Seoul, South Korea, 23-25 April 2012. [COA]

#### **RANDALL, CHRISTIAN E., Maj,**

Instructor of Logistics and Supply Chain Management, Department of Operational Sciences, AFIT Appointment date: 2012; BS, Business Administration, University of Phoenix, 1997; MS, Logistics Management, Air Force Institute of Technology, 2004. Major Randall’s research interests include supply chain management, disruption risk mitigation, collaboration and social networks, transportation and distribution. Tel. 937-255-3636 x 4337 (DSN 785-3636 x4337), email [Christian.Randall@afit.edu](mailto:Christian.Randall@afit.edu)

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Program Director, Master of Science in Logistics, Department of Operational Sciences.

Program Director, Master of Science in Logistics (ASAM), Department of Operational Sciences.

Reviewer, *Journal of Operations Management*.

#### **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](mailto:Matthew.Robbins@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

“Investigating Robust Decision Making in SSTRO.” Sponsor: AFRL HQ. Funding: \$102,000 – Robbins 50%, Deckro 50%. [COA]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Jacobson, S. H., Robbins, M. J., and Shanbhag, U., “A Game-Theoretic Pediatric Vaccine Pricing Model,” 2011 INFORMS National Meeting, November 13-16, 2011, Charlotte, NC. [COA]

Abbas, A., Herring, S., Robbins, M., Simms, K., and Spetzler, C., 2011, “Peer-To-Peer Decision Training: Teaching Decision Skills to Troubled Teens,” *OR/MS Today*, 38(4), 48-53. [COA]

Reviewer, *Military Operations Research, Transportmetrica, Naval Research Logistics*.

#### **SANDLIN, DORAL E., Lt Col,**

Assistant Professor of Logistics and Supply Chain Management, Department of Operational Sciences, AFIT Appointment Date: 2010 (AFIT/ENS); 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 x 4740, email: [Doral.Sandlin@afit.edu](mailto:Doral.Sandlin@afit.edu)

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

Jordan, J., Weir, J. D., and Sandlin, D. E., “Multiobjective Longest Paths for Military Transportation,” Industrial and Systems Engineers Research Conference 2012, Orlando, FL. [COA]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Program Chair, Master of Science in Logistics (ASAM), Department of Operational Sciences.

#### **SCHULTZ, KENNETH L.,**

Associate Professor of Logistics and Supply Chain Management, Department of Operational Sciences, AFIT Appointment Date: 2011; BS, Economics, University of Pennsylvania, 1980; PhD, Operations Management, Cornell University, 1997. Dr. Schultz’s research interests include improving operations management models by including the consideration of behavior issues including motivation and peer pressure in production systems and process flows. Tel. 937-255-3636 x 4725 (DSN785-3636 x 4725), e-mail: [Kenneth.Schultz@afit.edu](mailto:Kenneth.Schultz@afit.edu)

#### REFEREED JOURNAL PUBLICATIONS

Salzarulo, Peter A., Kurt M. Bretthauer, Murray J. Cote and Kenneth L. Schultz, “The Impact of Variability and Patient Information on Health Care System Performance,” *Production and Operations Management*, Vol. 20, pp 848-859, 2011. [COA]

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Production and Operations Management Society (POMS) Annual Conference, Chicago, IL, Plenary Speaker, Behavioral Operations Management mini-conference. May, 2012.

Treasurer, College of Behavioral Operations Management, Production and Operations Management Society.

Secretary, Behavioral Operations Management Sections, Institute for Operations Research and the Management Sciences (INFORMS).

Editor, Journal of Operations Management Special Issue on Behavioral Operations Management.

Conference Organization Committee, Behavioral Operations Annual Conference.

Schultz, K.L., Hagtvedt, R., Forgie, S., "Correlates and Predictors of Observed Hand Hygiene Compliance to Reduce Nosocomial Infections," INFORMS National Meeting, Nov 2011, Charlotte, N.C. [COA]

Schultz, K.L., Hagtvedt, R., "Empirical Results for Habitual Citizenship Behavior in Hand-Hygiene Compliance," INFORMS National Meeting, Nov 2011, Charlotte, N.C. [COA]

Editor of the biannual INFORMS Bops Section newsletter.

Reviewed a proposal for the Natural Sciences and Engineering Research Council of Canada (NSERC).

### **THOMAS, MARLIN U.,**

Dean, Graduate School of Engineering and Management, Appointment Date: 2006, 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. 937-255-3025 (DSN 785-3025), email: [Marlin.Thomas@afit.edu](mailto:Marlin.Thomas@afit.edu)

### **REFEREED JOURNAL PUBLICATIONS**

Thomas, M.U., "Some simplifying conditions for Markov chain modeling," *INFORMS TutORials in Operations Research*, Vol. 9, 2012.

Thomas, M.U., "Warranty modeling," *Wiley Encyclopedia of Operations Research and Management Science*, J.J. Cochran, Ed., Wiley, 2011.

### **OTHER SIGNIFICANT ACTIVITIES**

"Special Structures for Markov Chain Modeling," School of Computing, Informatics, and Decision Systems Engineering, Arizona State University, March 2, 2012.

"Managing Contingency Logistics Support Operations," Logistics and Distribution Institute, University of Louisville, October 26, 2011.

**WEIR, JEFFERY D.,**

Associate Professor of Operations Research, AFIT Appointment Dates: 2002-2008, 2009 (AFIT/ENS), Deputy Department Head; Bachelors of Electrical Engineering, Georgia Institute of Technology, 1988; MAS, Embry Riddle-Aeronautical University, 1992; MS, Air Force Institute of Technology, 1995; PhD, Georgia Institute of Technology, 2002. Dr. Weir's research interests include large-scale optimization, mathematical programming, and decision analysis. He is a member of the Institute for Operations Research and Management Science (INFORMS), the Military Operations Research Society (MORS), the Institute of Industrial Engineers (IIE) and the Decision Sciences Institute (DSI). Tel. 937-255-3636 x4538 (DSN 785-3636 x4538), email: [Jeffery.Weir@afit.edu](mailto:Jeffery.Weir@afit.edu)

**SPONSOR FUNDED RESEARCH PROJECTS**

"JDPAC and AFIT Distribution Research Proposal (LOC)." Sponsor: USTRANSCOM. Funding: \$250,000. [COA]

**REFEREED JOURNAL PUBLICATIONS**

Chambal, S., Weir, J. D., Kahraman, Y. and Gutman, A., "A Practical Procedure for Customizable One-Way Sensitivity Analysis (COSA) in Additive Value Models," *Decision Analysis*, December 2011, Vol. 8, No. 4, pp. 303-321. [COA]

Hu, M., Weir, J. D., Wu, T., "Decentralized Operation Strategies for an Integrated Building Energy System using a Memetic Algorithm," *European Journal of Operational Research*, Vol. 217, Issue 1, 16 February 2012, pp. 185-197. [COA]

Parson, C. R., Miller, J. O., Weir, J. D., "Simulation and Analysis of Mission Capability Degrades due to Supply for the B-1 Bomber," *The Journal of Defense Modeling and Simulation: Applications, Methodology, Technology*, July 2012, Vol. 9, No. 3, pp. 279-290. [COA]

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

Jordan, J., Weir, J. D., and Sandlin, D. E., "Multiobjective Longest Paths for Military Transportation," Industrial and Systems Engineers Research Conference 2012, Orlando, FL. [COA]

Gutman, A., and Weir J. D., "Randomly Generating Weights in a Bounded Region for Sensitivity Analysis," Industrial and Systems Engineers Research Conference 2012, Orlando, FL. [COA]

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

Leslie, J., Weir, J. D., and Grindey, G., "Joint Operational Support Airlift Center Flight Scheduling Tool," Military Operations Research Society Symposium, USAF Academy, 2012. [COA]

Hu, M., Weir, J.D., Wu, T., "Decentralized Operation Strategies for Building Cluster Using Particle Swarm Optimization," INFORMS Annual Conference, Charlotte, NC, Nov 2011. [COA]

**OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES**

Program Director, Master of Science in Operational Analysis, Department of Operational Sciences.

Session Chair, Industrial and Systems Engineering Research Conference (ISERC), 2012.

Reviewer, *Journal of Military Operations Research Society*.

Reviewer, *Decision Science Innovations in Education Journal*.

Reviewer, Industrial Engineering Research Conference Proceedings.

## **5.6. DEPARTMENT OF SYSTEMS AND ENGINEERING MANAGEMENT**

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### 5.6.1. DOCTORAL DISSERTATIONS

RYAN, ERIN T., *Cost-Based Decision Model for Valuing System Design Options*. AFIT/DS/ENV/12-01. Faculty Advisor: Dr. David R. Jacques. Sponsor: OSD.

### 5.6.2. MASTER'S THESES

ALOISI, ACHILLE H., *Space Systems Engineering Case Study Highlighting Challenges of Commonality*. AFIT/GSE/ENV/12-J02DL. Faculty Advisor: Dr. John M. Colombi. Sponsor: N/A.

ANDREWS, SEAN T., *An Analysis of Department of Energy Office of Environmental Management Project Cost Performance Using Logistic Regression*. AFIT/GCA/ENV/12-M01. Faculty Advisor: Dr. Timothy S. Reed. Sponsor: DOE.

BEECHER, BRIAN D., & MITCHELL, ANTHONY C., *Application of Extended Sequence Modeling to Evaluate Concept Maturity Within a Stage-Gated Framework*. AFIT/GSE/ENV/12-M01. Faculty Advisor: Dr. David R. Jacques. Sponsor: AFRL/RW.

CARRANO, RICHARD P., *Mitigating Diminishing Manufacturing Sources/Material Shortages (DMS/MS) and Obsolescence for the T-6 Canopy Fracturing Initiation System (CFIS)*. AFIT/GSE/ENV/12-M01DL. Faculty Advisor: Dr. John M. Colombi. Sponsor: ASC/WN.

CHRISTENSEN, MATTHEW B., *A Method for Measuring Programmatic Dependency and Interdependency Between DOD Acquisition Programs*. AFIT/GSE/ENV/11-D02DL. Faculty Advisor: Lt Col Joseph R. Wirthlin. Sponsor: OSD.

CONNELL, JOSHUA D., *An Analysis of Turnover Intentions: A Reexamination of Air Force Civil Engineering Company Grade Officers*. AFIT/GEM/ENV/12-M01. Faculty Advisor: Dr. Alfred E. Thal. Sponsor: HQ USAF/A7.

DANAHER, ALEC C., *Incorporating Externalities and Uncertainty into Life-Cycle Cost Analysis*. AFIT/GEM/ENV/12-M02. Faculty Advisor: Dr. Alfred E. Thal. Sponsor: AFCEE.

DELLOLAcono, BRAD M., *Remotely Piloted Aircraft (RPA) System of Systems (SOS): Wave Model Application and Analysis*. AFIT/GSE/ENV/12-J03DL. Faculty Advisor: Dr. John M. Colombi. Sponsor: OSD.

DELORIT, JUSTIN D., *Evaluation of Municipal Wastewater Treatment Plant Activated Sludge for Biodegradation of Propylene Glycol as an Aircraft Deicing Fluid*. AFIT/GEM/ENV/12-M03. Faculty Advisor: Maj LeeAnn Racz. Sponsor: AFMC.

DIROSARIO, JOSEPH P., *Asset Management: Roof Maintenance and Facility Energy Retrofits*. AFIT/GEM/ENV/12-M04. Faculty Advisor: Lt Col Peter P. Feng. Sponsor: N/A.

DRYLIE, SCOTT T., *Predictors and Predictive Effects of Attitudinal Inconsistency Towards Organizational Change*. AFIT/GCA/ENV/12-M04. Faculty Advisor: Lt Col John J. Elshaw. Sponsor: AFCAA.

ENDERBY, JAMES C., *Comparative Analysis of Two Biological Warfare Air Samplers Using Live Surrogate Agents*. AFIT/GIH/ENV/12-M01. Faculty Advisor: Lt Col Dirk P. Yamamoto. Sponsor: 711 HPW/USAFSAM.

ENGLISH, JACOB K., & MOLESWORTH, MICHAEL P., *Rapid Prototype Development of a Remotely-Piloted Aircraft Powered by a Hybrid-Electric Propulsion System*. AFIT/GSE/ENV/12-M02. Faculty Advisor: Dr. David R. Jacques. Sponsor: OSD. [ANT]

- FLORY, JASON R., *Influence of pH on the Transport of Silver Nanoparticles in Saturated Porous Media: Laboratory Experiments and Modeling*. AFIT/GIH/ENV/12-M02. Faculty Advisor: Maj LeeAnn Racz. Sponsor: AFMSA.
- GABRIELSON, TJ E., *Turnover Intentions: A Quantitative Analysis of Comments from Air Force Civil Engineering Company Grade Officers*. AFIT/GEM/ENV/12-M05. Faculty Advisor: Lt Col John J. Elshaw. Sponsor: N/A.
- GAUNTT, RYAN D., *Aircraft Course Optimization Tool Using GPOPS MATLAB Code*. AFIT/GSE/ENV/12-M03. Faculty Advisor: Dr. David R. Jacques. Sponsor: USSTRATCOM.
- GIACOMO, CHRISTOPHER, *Modeling, Simulation and Flight Test for Automatic Flight Control of the Condor Hybrid-Electric Remote Piloted Aircraft*. AFIT/GSE/ENV/12-M04. Faculty Advisor: Dr. David R. Jacques. Sponsor: OSD. [ANT]
- GILMAN, JACOB M., *Simplified Daylight Spectrum Approximation by Blending Two Light Emitting Diode Sources*. AFIT/GEM/ENV/12-M06. Faculty Advisor: Dr. Michael E. Miller. Sponsor: AFCESA.
- GRANGER, AARON R., *An Analysis of C-17 Pilot Checklist Development, Control, and Effectiveness in Supporting Flight Operations*. AFIT/GSE/ENV/11-D03DL. Faculty Advisor: Dr. Michael E. Miller. Sponsor: AMC.
- HALWES, SCOTT W., *Impact of Self-Reported Biases and Familiarity in a Baggage Screening Context*. AFIT/GIR/ENV/12-M01. Faculty Advisor: Lt Col Brent T. Langhals. Sponsor: N/A.
- HANOKA, WESTON J., & RYAN, MICHAEL H., *A Study of Executable Model Based Systems Engineering from DODAF Using Simulink*. AFIT/GSE/ENV/12-S05DL. Faculty Advisor: Lt Col Brent T. Langhals. Sponsor: SMC.
- HARNLY, MARIE T., *Infrastructure Asset Management Modeling Through an Analysis of the Air Force Strategic Vision and Goals*. AFIT/GEM/ENV/12-M07. Faculty Advisor: Lt Col William E. Sitzabee. Sponsor: AFCESA & HQ USAF/A7.
- HARPER, CAROLE A., *Security Standards and Best Practice Considerations for Quantum Key Distribution (QKD)*. AFIT/GSE/ENV/12-M05. Faculty Advisor: Dr. Michael R. Grimala. Sponsor: LTS.
- HOGGE, LOUIS J., *Effective Measurement of Reliability of Repairable USAF Systems*. AFIT/GSE/ENV/12-S02DL. Faculty Advisor: Dr. John M. Colombi. Sponsor: AFMC/748 SCMG.
- HOLLINGSWORTH, JOSHUA D., *Understanding the Impact of Bead Type on Paint and Thermoplastic Pavement Markings*. AFIT/GEM/ENV/12-M08. Faculty Advisor: Lt Col William E. Sitzabee. Sponsor: N/A.
- JASZKOWIAK, JOHN C., *Maintenance Operations of Airfield Pavement Markings*. AFIT/GEM/ENV/12-M09. Faculty Advisor: Lt Col William E. Sitzabee. Sponsor: N/A.
- JASZKOWIAK, LINDSAY M., *Firm Fixed Price and Cost Plus Fixed Fee Construction Contracts in Iraq and Afghanistan*. AFIT/GEM/ENV/12-M10. Faculty Advisor: Lt Col Peter P. Feng. Sponsor: AFCEE.
- KINNE, JEREMY P., *The Effect of Multiple Interventions on Environmental Attitudes and Behaviors*. AFIT/GEM/ENV/12-M11. Faculty Advisor: Dr. Alfred E. Thal. Sponsor: AMC/60 CES & ACC/9 CES.
- KIRCHNER, AIMEE T., *The Effects of Cognitive-Behavioral Motivation for Health Improvement on Anthropometric Measurements in High Risk Individuals*. AFIT/GCA/ENV/12-M02. Faculty Advisor: Lt Col Darin A. Ladd. Sponsor: AFMC/88 AMDS.

KNORR, LAURIE C., *Leading Indicator Analysis for High Speed Sled Test Programs*. AFIT/GSE/ENV/12-M03DL. Faculty Advisor: Dr. John M. Colombi. Sponsor: AFMC/846 TS.

LASORDA, MICHAEL J., *Thermal Space Situational Awareness*. AFIT/GSE/ENV/12-S03DL. Faculty Advisor: Dr. John M. Colombi. Sponsor: AFRL/RD.

LEUTHOLD, NATHAN M., *A Proposed Mediation Model of the Effects of Motivation for a Healthy Lifestyle: Impacts on Emotional Exhaustion, Medication Regimens and Low-Density Lipoprotein*. AFIT/GEM/ENV/12-M12. Faculty Advisor: Lt Col John J. Elshaw. Sponsor: N/A.

LORIMER, SETH M., *Improving Effectiveness of Monetary Weapon Systems in Afghanistan*. AFIT/GEM/ENV/12-M13. Faculty Advisor: Lt Col Peter P. Feng. Sponsor: N/A.

LUDOVICE, SMILE T., *Analysis of the Impact of Data Normalization on Cyber Event Correlation Query Performance*. AFIT/GIR/ENV/12-M03. Faculty Advisor: Dr. Michael R. Grimala. Sponsor: AFSPC.

MACHUCA, JOHN P., *Streamlining the Change-Over Protocol for the RPA Mission Intelligence Coordinator by Way of Situation Awareness Oriented Design and Discrete Event Simulation*. AFIT/GSE/ENV/12-06. Faculty Advisor: Dr. Michael E. Miller. Sponsor: 711 HPW/RH.

MALINE, JARED J., *Reducing Operating Costs by Optimizing Space in Facilities*. AFIT/GEM/ENV/12-M14. Faculty Advisor: Lt Col William E. Sitzabee. Sponsor: N/A.

MCPHERSON, ANDREW W.E., *Optimization of Nanoscale Zero-Valent Iron for the Remediation of Groundwater Contaminants*. AFIT/GES/ENV/12-M01. Faculty Advisor: Dr. Mark N. Goltz. Sponsor: NFESC.

MITCHELL, ANTHONY C., See BEECHER, BRIAN D.

MOLESWORTH, MICHAEL P., See ENGLISH, JACOB K.

NELSON, ERIC W., *Link Performance Analysis for a Proposed Future Architecture of the Air Force Satellite Control Network*. AFIT/GSE/ENV/11-D06DL. Faculty Advisor: Dr. John M. Colombi. Sponsor: N/A.

OCHS, KEVIN S., *Time-Valued-Technology: A Light-Emitting Diode Case Study for Determining Replacement Strategy for High Technology Infrastructure Items*. AFIT/GEM/ENV/12-M15. Faculty Advisor: Dr. Michael E. Miller. Sponsor: AFCESA.

O'CONNELL, PHILLIP J., *Systems Engineering Applications for Small Business Innovative Research (SBIR) Projects*. AFIT/GSE/ENV/12-S01. Faculty Advisor: Lt Col Joseph R. Wirthlin. Sponsor: AFRL/XP.

OPPENHEIMER, VAL, *Prototyping the Use of Dispersion Models to Predict Ground Concentrations During Burning of Deployed Military Waste*. AFIT/GEM/ENV/12-M16. Faculty Advisor: Lt Col Dirk P. Yamamoto. Sponsor: 711 HPW/USAFSAM.

OSPINA, FRANCISCO, *An Enhanced Fuselage Ultrasound Inspection Approach for ISHM Purposes*. AFIT/GSE/ENV/12-M12. Faculty Advisor: Dr. Som R. Soni. Sponsor: AFRL/RX.

POND, TRAVIS J., *Discrete Event Simulation of Distributed Team Communication Architecture*. AFIT/GSE/ENV/12-M07. Faculty Advisor: Dr. Michael E. Miller. Sponsor: 711 HPW/RH.

ROSE, CHRISTOPHER W., *An Enhanced Satellite Command and Control Systems Architecture*. AFIT/GSE/ENV/12-M09. Faculty Advisor: Dr. David R. Jacques. Sponsor: 381 TRG.



ROZZONI, JAMES M., *Analysis of Leadership in Energy and Environmental Design® Construction in the Air Force*. AFIT/GEM/ENV/12-M17. Faculty Advisor: Lt Col Peter P. Feng. Sponsor: N/A.

RYAN, MICHAEL H., See HANOKA, WESTON J.

SANDUSKY, JEFFREY C., *Individual Resistance to Change*. AFIT/GIR/ENV/12-S01. Faculty Advisor: Lt Col John J. Elshaw. Sponsor: N/A.

SCHIFF, ZACHARY L., *A Spatial Risk Analysis of Oil Refineries within the United States*. AFIT/GEM/ENV/12-M18. Faculty Advisor: Lt Col William E. Sitzabee. Sponsor: N/A.

SCHULDT, STEVEN J., *Biodegradation of Organophosphate Chemical Warfare Agents by Activated Sludge*. AFIT/GES/ENV/12-M04. Faculty Advisor: Maj LeeAnn Racz. Sponsor: EPA.

SHA, FRANK T., *Structural Health Monitoring of M1114 High Mobility Multipurpose Wheeled Vehicle Armor System*. AFIT/GEM/ENV/12-M19. Faculty Advisor: Dr. Som R. Soni. Sponsor: N/A.

SIEVERS, KATHERINE W., *Modeling the Impact of Cracking in Low Permeability Layers in a Groundwater Contamination Source Zone on Dissolved Contamination Fate and Transport*. AFIT/GES/ENV/12-M02. Faculty Advisor: Dr. Mark N. Goltz. Sponsor: SERDP.

SMITH, ANDREW R., *Rapid Development: A Content Analysis Comparison of Literature and Purposive Sampling of AFRL Rapid Reaction Projects*. AFIT/GRD/ENV/11D-01. Faculty Advisor: Dr. John M. Colombi. Sponsor: AFRL/R.Y.

SORENSEN, NATHANIEL T., *Quantum Channel Modeling for Discrete Event Simulation of Quantum Key Distribution*. AFIT/APPLPHY/ENV/12-M01. Faculty Advisor: Dr. Michael R. Grimaila. Sponsor: LTS.

STEVENS, TODD J., *Stabilizing Acetylcholinesterase on Carbon Electrodes Using Peptide Nanotubes to Produce Effective Biosensors*. AFIT/GES/ENV/12-M03. Faculty Advisor: Dr. Mark N. Goltz. Sponsor: NFESC.

STURTEVANT, MATTHEW D., *The Application of Sensors on Guardrails for the Purpose of Real Time Impact Detection*. AFIT/GEM/ENV/12-M20. Faculty Advisor: Lt Col William E. Sitzabee. Sponsor: N/A.

TRAN, TUAN U., *Unmanned Aerial Vehicle Flight Test Approval Process and its Implications: A Methodological Approach to Capture and Evaluate Hidden Costs and Value in the Overall Process*. AFIT/GRD/ENV/12-M04. Faculty Advisor: Lt Col Joseph R. Wirthlin. Sponsor: AFRL/R.Y.

WASHINGTON, DAVID, *The Moderating Effect of Psychological Empowerment on the Relationship Between Network Centrality and Individual Job Performance*. AFIT/GEM/ENV/12-M21. Faculty Advisor: Lt Col John J. Elshaw. Sponsor: N/A.

WEBSTER, BRANDON M., *Implementing a Quantitative Analysis Design Tool for Future Generation Interfaces*. AFIT/GSE/ENV/12-M08. Faculty Advisor: Dr. John M. Colombi. Sponsor: 711 HPW/RH.

WOODALL, BRIAN D., *Emissions from Simulated Open Burning of Deployed US Military Waste*. AFIT/GES/ENV/12-M05. Faculty Advisor: Lt Col Dirk P. Yamamoto. Sponsor: AFMSA.

YOUD, DAVID J., *A Nonparametric Statistical Analysis of Department of Energy Office of Environmental Management Project Cost Performance*. AFIT/GCA/ENV/12-M07. Faculty Advisor: Dr. Timothy S. Reed. Sponsor: DOE.

ZORN, AARON J., *High-Performance Work Practices: A Case Study Using the Phenomenological Approach*. AFIT/GEM/ENV/12-M22. Faculty Advisor: Dr. Alfred E. Thal. Sponsor: N/A.

### 5.6.3. GRADUATE RESEARCH PAPERS

COLBURN, RYAN M., FORD, JENNIFER S., & MORRIS, YOSEF A., *Principles of Rapid Acquisition and Systems Engineering*. AFIT/ISE/ENV/12-J01. Faculty Advisor: Dr. John M. Colombi. Sponsor: N/A.

FORD, JENNIFER S., See COLBURN, RYAN M.

HARVEY, WALTER B., & RYAN, CHARLES M., *A Quantitative Analysis of the Benefits of Prototyping Fixed-Wing Aircraft*. AFIT/GSE/ENV/12-J02. Faculty Advisor: Dr. John M. Colombi. Sponsor: ASC.

HORTON, JASON D., *Conflict: Operational Realism Versus Analytical Rigor in Defense Modeling and Simulation*. AFIT/ISE/ENV/12-J04. Faculty Advisor: Dr. David R. Jacques. Sponsor: AFLCMC.

MONTGOMERY, JONATHON A., *Expansion of Enterprise Requirements and Acquisition Model*. AFIT/ISE/ENV/12-J03. Faculty Advisor: Lt Col Joseph R. Wirthlin. Sponsor: SMC.

MORRIS, YOSEF A., See COLBURN, RYAN M.

PRITCHETT, MICHAEL D., *Cyber Mission Assurance: A Guide to Reducing the Uncertainties of Operating in a Contested Cyber Environment*. AFIT/ICW/ENV/12-J01. Faculty Advisor: Dr. Michael R. Grimala. Sponsor: AFSPC.

RYAN, CHARLES M., See HARVEY, WALTER B.

SWARTZMILLER, JUSTIN W., *Securing the Next Ripple in Information Security: The Defense Industrial Base (DIB)*. AFIT/ICW/ENV/12-J02. Faculty Advisor: Dr. Alan R. Heminger. Sponsor: AFOSI.

#### 5.6.4. FACULTY BIOGRAPHIES & RESEARCH OUTPUT

Notes: Research Center affiliation is listed in [ ] if applicable. Shared credit for funding awards is indicated by the percentages shown for each faculty member associated with the project.

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

Professor and Head, Department of Systems and Engineering Management, AFIT Appointment Date: 2006 (AFIT/ENV); BS, Tennessee Technological University, 1979; MS, Tennessee Technological University, 1981; PhD, Industrial Engineering, University of Central Florida, 1984. Dr. Badiru's research interests include Project Modeling, Analysis, Management, and Control, Mathematical Modeling, Computer Simulation, Information Systems, and Economic Analysis. He is the author of several books and technical journals. Tel. 937-255-3636 x4799 (DSN 785-3636 x4799), email: [Adedeji.Badiru@afit.edu](mailto:Adedeji.Badiru@afit.edu)

##### SPONSOR FUNDED RESEARCH PROJECTS

"System Engineering Efficiency Research." Sponsor: SAF. Funding: \$76,000 – Badiru 25%, Wirthlin 25%, Sitzabee 25%, Thal 25%.

##### REFEREED JOURNAL PUBLICATIONS

Badiru, A. B., "Application of the DEJI Model for Aerospace Product Integration," *Journal of Aviation and Aerospace Perspectives (JAAP)*, Vol. 2, No. 2, Fall 2012 (to appear).

Badiru, A. B., "Half-Life Learning Curves in the Defense Acquisition Lifecycle," *Defense Acquisition Research Journal*, Vol. 19, No. 3, pp. 283-308, 2012.

Wu, Teresa; Mengqi Hu; A. B. Badiru; and Som Soni, "A Single Loop Deterministic Method for Reliability Based Design Optimization," *Engineering Optimization*, published online, *iFirst*, July 2012, pp. 1-24.

Badiru, A. B. and Rochelle R. Jones, "Project Management for Executing Distance Education Programs," *Journal of Professional Issues in Engineering Education and Practice*, Vol. 138, No. 3, July 2012, pp. 154-162.

Badiru, A. B. and Rochelle R. Jones, "A Systems Framework for Distance Learning in Engineering Graduate Programs," *Systems Engineering Journal*, Vol. 15, No. 1, 2012.

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

Soni, Som R., A. Al-Romaihi, J. R. Wirthlin and A. B. Badiru, "Reliability Aspects In Z-Pinned Co-Cured Composites," IEOM 2012 (Industrial & Operations Management) Conference, Ankara, Turkey, July 3-6, 2012.

Badiru, A. B., "Quantitative Modeling for Military Operational Efficiency, Effectiveness, and Productivity Analysis," in Proceedings of 2012 Annual Conference of Industrial & Systems Engineering Research Conference, Orlando, FL, May 19-23, 2012.

Omitaomu, O. A. and A. B. Badiru, "An Economic Evaluation Framework for Assessing Renewable Energy Projects," in Proceedings of 2012 Annual Conference of Industrial & Systems Engineering Research Conference, Orlando, FL, May 19-23, 2012.

Soni, Som; A. B. Badiru; and Teresa Wu, "Process Improvement Example in Product Design of Durable Forearm Crutch," International Conference on Agile Manufacturing Systems (ICAM-2011), Agra, India, Dec 18-20, 2011.

### BOOKS AND CHAPTERS IN BOOKS

Badiru, A. B., Oye Ibidapo-Obe, and B. J. Ayeni (2012), *Industrial Control Systems: Mathematical and Statistical Models and Techniques*, Taylor & Francis CRC Press, Boca Raton, FL.

Badiru, A. B. (2012), *Project Management: Systems, Principles, and Applications*, Taylor & Francis CRC Press, Boca Raton, FL.

Badiru, A. B. and Tina Kovach, *Statistical Techniques for Project Control* (2012), Taylor & Francis CRC Press, Boca Raton, FL.

### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Badiru, A. B., “Taking flight with science in sports,” presented at Dayton-Cincinnati Aerospace Science Symposium (DCASS2012), Dayton, OH, March 5, 2012.

Badiru, A. B., Invited presentation, “Linking Science and Sports for STEM Education: The Case of the Soccer Ball, Gravity, and Friction,” 2011 Dayton Engineering Sciences Symposium (DESS), Dayton, Ohio, Oct 24, 2011.

Badiru, A. B., Technical Seminar, “Enhancing Technology Interfaces Using Project Management Techniques,” 2011 TechNet-Aero Convention, Dayton, Ohio, Oct 17-20, 2011.

Badiru, A. B., Technical seminar, “Systems Framework for Communication, Cooperation, and Coordination in Emergency Response,” 4th CBRNE Research and Education Collaboration Symposium, Air Force Institute of Technology, Wright Patterson Air Force Base, Dayton, Ohio, 2011.

### **COLOMBI, JOHN M.,**

Assistant Professor of Systems Engineering, Department of Systems and Engineering Management, AFIT  
Civilian Appointment Date: 2008 (AFIT/ENV); BSEE, University of Lowell, 1982; MSEE, Air Force Institute of Technology, 1992; PhD, Electrical Engineering, Air Force Institute of Technology, 1996. Dr. Colombi’s research interests within the growing discipline of Systems Engineering include: systems architecture, systems of systems analysis, complex adaptive systems and human systems integration. Tel. 937-255-3636 x3347, email: [John.Colombi@afit.edu](mailto:John.Colombi@afit.edu)

### SPONSOR FUNDED RESEARCH PROJECTS

“High Velocity Acquisition: Life Cycle Cost Leading Indicators.” Sponsor: ASC. Funding: \$67,400 – Colombi 40%, Jacques 20%, Unger 20%, Wirthlin 20%.

“Enterprise Requirements and Acquisition Model (ERAM) Analysis and Extension.” Sponsor: NPS. Funding: \$69,000 – Colombi 50%, Wirthlin 50%.

### REFEREED JOURNAL PUBLICATIONS

Ryan, E., D. Jacques and J. Colombi, “An Ontological Framework for Clarifying Flexibility-Related Terminology via Literature Survey,” *Journal of Systems Engineering*, August 2012.

Michael Schneider, Jason McGrogan, John M. Colombi, Michael E. Miller, John Plaga, “Predictive Mental Workload Modeling: Implications for System Design,” *Journal of Systems Engineering*, 448-460, July 2012.

John M. Colombi, Christopher Cobb and Damian Gallegos, “Live-Virtual-Constructive Capabilities for Testing and Training,” *Int’l Journal of Test and Evaluation (ITEA)*, Vol. 33, No. 1, March 2012, pp. 49-57.

Nicholas Hardman and John Colombi, "An Empirical Methodology for Human Integration in the SE Technical Processes," *Journal of Systems Engineering*, Vol. 15, No. 2, Summer 2012, pp. 172-190.

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*, May 2012.

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

Nil Kilicay-Ergin, Paulette Acheson, John Colombi, Cihan H. Dagli, Judith Dahmann, "Modeling System of Systems Acquisition," IEEE SOSE 2012, July 16-19 2012 - Genoa, Italy.

John M. Colombi, Cooperative layered sensing: A factor analysis on finding elusive mobile targets, SPIE Defense, Security, and Sensing, Baltimore, Maryland, USA, 23-27 April 2012. [spie.org/dss](http://spie.org/dss).

John P. Machuca, Michael E. Miller, John M. Colombi, A Cognitive Task Analysis-based Evaluation of Remotely Piloted Aircraft Situation Awareness Transfer Mechanisms, The 2nd IEEE International Conference on Cognitive Methods in Situation Awareness and Decision Support 2012, 6 - 8 March 2012, New Orleans, LA.

Ryan, E., D. Jacques, J. Colombi and C. Schubert, "A Proposed Methodology to Characterize the Accuracy of Life Cycle Cost Estimates for DOD Programs", New Challenges in Systems Engineering and Architecting: Conference on Systems Engineering Research, St. Louis, MO, 19-22 March, 2012.

Travis Pond, Brandon Webster, John Machuca, John Colombi, Michael Miller, Randall Gibb, Allocation of Communications to Reduce Mental Workload, Conference on Systems Engineering Research (CSER) 2012, St. Louis, MO.

#### **ELSHAW, J. JOHN, Lt Col,**

Deputy Head and 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](mailto:John.Elshaw@afit.edu)

#### **FASS, R. DAVID, Lt Col,**

Assistant Professor of Management; BS, Economics, University of New Mexico, 1989; MBA, University of New Mexico, 1993, PhD, College of Business, Department of Management, New Mexico State University, 2007. His research interests include strategic management, organizational behavior, organizational development and change, government contracting, multilateral alliances ("constellations"), Austrian economics, prescriptive vs. descriptive research models, social network methods, structural equation modeling, transcendent goals, and enriching web-based learning. Tel. 937-255-3636 x4826 (DSN 785-3636 x4826), email: [Robert.Fass@afit.edu](mailto:Robert.Fass@afit.edu)

#### **FENG, PETER P., Lt Col,**

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. Lt Col Feng's research interests include Lean Theory and its application to facility design and construction, contingency construction management, construction management, decision analysis, sustainability, life cycle assessment, and discrete event simulation. Tel. 937-255-3636 x4648 (DSN 785-3636 x4648), email: [Peter.Feng@afit.edu](mailto:Peter.Feng@afit.edu)

#### REFEREED JOURNAL PUBLICATIONS

Gannon, T., Feng, P., and Sitzabee, W., “Reliable Schedule Forecasting in Federal Design-Build Facility Procurement,” *Lean Construction Journal*, pp. 1-14 (January, 2012).

#### **GIBB, RANDALL W., Col**

Colonel, USAF, Senior Military Professor, College of Engineering & Management, AF Institute of Technology, Wright-Patterson AFB, OH; BS USAF Academy, 1986; MSE, Arizona State University, 1996; MA, Naval War College, 2000; PhD, Arizona State University, 2007. Col Gibb specializes in Human Factors Engineering researching spatial disorientation, visual perception, aviation safety, and remotely piloted aircraft. 937-255-3636, x4574, email: [Randall.Gibb@afit.edu](mailto:Randall.Gibb@afit.edu)

#### **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 contaminants in the subsurface. He is also interested in the environmental fate and transport of nanomaterials, as well as the use of nanomaterials to remediate water contamination. Tel. 937-255-3636 x4638 (DSN 785-3636 x4638), email: [Mark.Goltz@afit.edu](mailto:Mark.Goltz@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

“Fate and Transport of Nanosilver in Groundwater Phase II.” Sponsor: AFMSA. Funding: \$79,245 – Goltz 50%, Racz 50%.

“Hydrogeophysical Impact of Clay-DNAPL Interactions on Storage of Chlorinated Solvents in Low Permeability Zones.” Sponsor: SERDP. Funding: \$39,553.

#### REFEREED JOURNAL PUBLICATIONS

Grace, S.T., D.A. Lytle, M.N. Goltz, “Control of New Copper Corrosion in High-Alkalinity Drinking Water,” *Journal of the American Water Works Association*, 104(1):39-40, 2012.

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

Kanel, S.R., J. Dagher, T. Meidinger, I.E. Sizemore, L. Racz, C.A. Impellitteri, and M.N. Goltz, Fate and transport of silver nanoparticles and silver ions in saturated porous media: Laboratory experiments and modeling, 244th American Chemical Society National Meeting & Exhibition, Philadelphia, PA, 19-23 August 2012.

Stevens, T.J., D.S. Kim, S.R. Kanel, and M.N. Goltz, Stabilizing acetylcholinesterase on carbon electrodes to produce effective biosensors, 244th American Chemical Society National Meeting & Exhibition, Philadelphia, PA, 19-23 August 2012.

Flory, J.R., S.R. Kanel, L. Racz, C.A. Impellitteri, R.G. Silva, and M.N. Goltz, Influence of pH on the Transport of Silver Nanoparticles in Saturated Porous Media: Lab Experiments and Modeling, 86th ACS Colloid & Surface Science Symposium, Johns Hopkins University, MD, 11-13 June 2012.

Kanel, S.R., J. Flory, L. Racz, M.N. Goltz, Road towards Sustainability: Understanding Silver Nanoparticle and Silver Ion Transport in Saturated Porous Media, World Environmental and Water Resources Congress, Albuquerque, NM, 20-24 May 2012.

Goltz, M.N., E. Becvar, and S. Friant, The Challenges of Large Dissolved Phase Groundwater Plumes within the Department of Defense, Eighth International Conference on Remediation of Chlorinated and Recalcitrant Compounds, Monterey, CA, 21-24 May 2012.

- Danner, K.M., A. Agrawal, A. McPherson, M.N. Goltz, Reactivity of Nano-Valent Iron Stabilized in Carboxymethylcellulose towards Chlorinated Aliphatic Hydrocarbons, Eighth International Conference on Remediation of Chlorinated and Recalcitrant Compounds, Monterey, CA, 21-24 May 2012.
- Kanel, S.R., J. Flory, L. Racz, C.A. Impellitteri, M. Nadagouda, C. Patterson, R.G. Silva, J. Huang and M.N. Goltz, Fate and transport of silver nanoparticles and related products in saturated porous media, 243rd American Chemical Society National Meeting & Exhibition, San Diego, CA, 25-29 March 2012.
- Agrawal, A., K.M. Danner, A. McPherson, M.N. Goltz, Abiotic Reduction of Halogenated Aliphatic Hydrocarbons by Stabilized Bimetallic Nickel-Zerovalent Iron (Ni-nZVI) Nanoparticles, 243rd American Chemical Society National Meeting & Exhibition, San Diego, CA, 25-29 March 2012.
- McPherson, A., S.R. Kanel, K.M. Danner, A. Agrawal, M.N. Goltz, Degradation of Carbon Tetrachloride by Stabilized Bimetallic Palladium-Zero-Valent Iron (Pd-nZVI) Nanoparticles, 243rd American Chemical Society National Meeting & Exhibition, San Diego, CA, 25-29 March 2012.
- Flory, J., S.R. Kanel, L. Racz, C.A. Impellitteri, and M.N. Goltz, Influence of pH on the transport of silver nanoparticles in saturated porous media, USAF ASC/AFRL Engineered Nanomaterials Environment, Safety, & Health Workshop, Fairborn, OH, 10-12 January 2012.
- Ayral, D., M. Otero, A. Demond, M.N. Goltz, and J. Huang, Diffusion of Chlorinated Organic Contaminants into Aquitards: Enhanced by the Flocculation of Clay?, American Geophysical Union Fall 2011 Meeting, San Francisco CA, 5-9 December 2011.
- Sievers, K., M.N. Goltz, J. Huang, and A.H. Demond, Modeling the Impact of Cracking in Low Permeability Layers in a Groundwater Contamination Source Zone on Dissolved Contaminant Fate and Transport, American Geophysical Union Fall 2011 Meeting, San Francisco CA, 5-9 December 2011.
- Sievers, K.W., M.N. Goltz, J. Huang, and A.H. Demond, Modeling the Impact of Cracking in Low Permeability Layers in a Groundwater Contamination Source Zone on Dissolved Contaminant Fate and Transport, Partners in Environmental Technology Technical Symposium and Workshop, Washington DC, 29 November – 1 December 2011.
- Demond, A.H., M.N. Goltz and J. Huang, Impact of Clay-DNAPL Interactions on Transport of Chlorinated Solvents into Low Permeability Zones, Partners in Environmental Technology Technical Symposium and Workshop, Washington DC, 29 November – 1 December 2011.
- McPherson, A., K. Danner, A. Agrawal, S.R. Kanel, and M.N. Goltz, Use of Stabilized Bimetallic Nanoscale Zerovalent Iron to Destroy Water Contaminants, 9th Annual Nano Technology for Defense Conference, Bellevue WA, 24-27 October 2011.
- Park, B.W., T.J. Stevens, D.S. Kim, D.Y. Yoon, and M.N. Goltz, Nano-Biotechnology for Lightweight Portable Sensor Device Development, 9th Annual Nano Technology for Defense Conference, Bellevue WA, 24-27 October 2011.

#### BOOKS AND CHAPTERS IN BOOKS

- Goltz, M.N. and J.A. Christ, Recirculation Systems, in: P.K. Kitinidis and P.L. McCarty, eds., *Delivery and Mixing in the Subsurface: Processes and Design Principles for In Situ Remediation*, ISBN 978-1-4614-2238-9, Springer, New York, 2012.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

- Minter, J.M., M.N. Goltz, A.H. Demond, and J. Huang, Diffusion in Clay Layers and Groundwater Remediation, *Air Force Civil Engineer*, 19(3): 22-23, 2011.

Session chair, Eighth International Conference on Remediation of Chlorinated and Recalcitrant Compounds, May 2012.

Session chair, 2011 Fall Meeting of the American Geophysical Union.

American Academy of Environmental Engineers Education Committee.

Society of American Military Engineers Kittyhawk Post Education Committee Chair.

**GRMAILA, MICHAEL R.,**

Associate Professor and Assistant Head of Research, Department of Systems and Engineering Management, AFIT Appointment Date: 2004 (AFIT/ENV); BS, Texas A&M University, 1993; MS, Texas A&M University, 1995; PhD, Computer Engineering, Texas A&M University, 1999. Dr. Grimaila's research interests include modeling and simulation, mission assurance, network management and security, quantum cryptography, and systems engineering. He is a member of the ACM, a Senior Member of the IEEE, a Fellow of the ISSA, and serves as an advisor to the Price of Wales Fellows / Prince Edward Fellows at MIT and Harvard. Tel. 937-255-3636 x4800 (DSN 785-3636 x4800), email: [Michael.Grimaila@afit.edu](mailto:Michael.Grimaila@afit.edu)

SPONSOR FUNDED RESEARCH PROJECTS

"Communication Channel Security." Sponsor: LTS. Funding: \$105,000 – Grimaila 50%, Humphries 50%. [CCR]

"Support of the Robust Decision Making for Improved Mission Assurance STT." Sponsor: AFRL HQ. Funding: \$51,000. [CCR]

REFEREED JOURNAL PUBLICATIONS

Gilman, J.M., Miller, M.E., and Grimaila, M.R., "A Simplified Control Scheme for a Daylight-Matched LED Lamp," Lighting Research and Technology, Sage Press, DOI: 10.1177/1477153512452276, September 26, 2012.

Vaarandi, R. and Grimaila, M.R., "Security Event Processing with Simple Event Correlator," The Information System Security Association (ISSA) Journal, August 2012, pp. 30-37.

Grimaila, M.R., Myers, J., Mills, R.F., and Peterson, G., "Design and Analysis of a Dynamically Configured Log-based Distributed Security Event Detection Methodology," The Journal of Defense Modeling and Simulation: Applications, Methodology, Technology, Sage Press, DOI: 10.1177/1548512911399303, Vol. 9(3), pp. 219-241, July 2012.

Grimaila, M.R., Morris, J., Hodson, D., "Quantum Key Distribution: A Revolutionary Security Technology," The Information System Security Association (ISSA) Journal, June 2012, pp. 20-27.

Kelly, D., Raines, R., Baldwin, R., Mullins, B., and Grimaila, M.R., "Exploring Extant and Emerging Issues in Anonymous Networks: A Taxonomy and Survey of Protocols and Metrics," IEEE Communications Surveys and Tutorials, Vol. 14, No. 2, 2012, pp. 579-606.

Dube, T., Raines, R., Peterson, G., Bauer, K., Grimaila, M.R. and Rogers, S., "Malware Target Recognition via Static Heuristics," Computers and Security, Vol. 31, Issue 1, February 2012, pp. 137-147.

Bryant, A.R., Mills, R.F., Peterson, G.L., and Grimaila, M.R., "Software Reverse Engineering as a Sensemaking Task," Journal of Information Assurance and Security. 6(6), 2012, pp. 483-494.



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

Evans, M., Grimaila, M.R., and Mills, R.F., “A Survey of Cyberspace Mission Assurance within United States Air Force Communications Squadrons,” Proceedings of the 2012 International Conference on Security and Management (SAM12), Las Vegas, Nevada, July 16-19, 2012.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Grimaila, Michael R., Steering Committee Member of the World Congress in Computer Science, Computer Engineering, and Applied Computing (WORLDCOMP), 2012.

Grimaila, Michael R., Invited Tutorial, “Quantum Key Distribution Tutorial”, World Congress in Computer Science, Computer Engineering, and Applied Computing (WORLDCOMP 2012), July 16, 2012.

Grimaila, Michael R., Conference Committee, 2012 International Conference on Security and Management, 2012.

Grimaila, Michael R., Conference Committee, 2012 NATO Cooperative Cyber Defence Centre of Excellence (CCD COE) International Conference on Cyber Conflict, Tallinn, Estonia.

Grimaila, Michael R., Conference Committee, Program Protection and Reverse Engineering (PPREW), 6th Annual International Conference on Information Systems, Technology & Management (ICISTM 2012).

Grimaila, Michael R., Conference Committee, IEEE Symposium on Computational Intelligence in Cyber Security (CICS 2012).

Grimaila, Michael R., Conference Committee, European Conference on Information Warfare and Security (ECIW 2012).

Grimaila, Michael R., Conference Committee, International Conference on Information Warfare and Security (ICIW 2012).

Grimaila, Michael R., Editorial Board Member, Information System Security Association (ISSA) Journal.

Grimaila, Michael R., Referee for Journal of Defense Modeling and Simulation, Journal of Network and Systems Management, and Military Operations Research Society Journal.

#### **HARPER, WILLIE F. JR.,**

Associate Professor, Department of Systems and Engineering Management, AFIT Appointment Date: 2012 (AFIT/ENV); BS, Civil Engineering, University of California, Los Angeles, 1992; MENG, Environmental Engineering Cornell University, 1993; PhD, Environmental Engineering, University of California, Berkeley, 2002. Dr. Harper is interested in biotechnology for environmental applications related to water quality. Research topics include biotransformation of micro-contaminants, biosensing, microbial products, enzymatic processes, and environmental sustainability. Tel. 937-255-3636 x4528 (DSN 785-3636x4528), email: [Willie.Harper@afit.edu](mailto:Willie.Harper@afit.edu)

#### REFEREED JOURNAL PUBLICATIONS

Kullapa Soratana, Willie F. Harper, Jr., and Amy E. Landis. (2012). Microalgal diesel and the RFS GHG Requirement. *Energy Policy*, Vol. 46, 498-510.

Cheng, W. and W.F. Harper, Jr. (2012). Chemical kinetics and interactions involved in Horseradish Peroxidase-mediated oxidative polymerization of phenolic compounds. *Enzyme and Microbial Technology*, Vol. 50(3), 204-208.

Yi, T., Barr, W., and W.F. Harper, Jr. (2012). Electron density-based transformation of trimethoprim during biological wastewater treatment. *Water Science and Technology*, Vol. 65(4), 689-696.

Barr, W., Yi, T., Aga, D., Acevedo, O., and W.F. Harper, Jr. (2012). Using electronic theory to identify metabolites in 17 $\alpha$ -ethinylestradiol transformation pathways. *Environmental Science and Technology*, Vol. 46(2), 760-768.

**HEMINGER, ALAN R.,**

Associate Professor, Department of Systems and Engineering Management, AFIT Appointment Date: 1994 (AFIT/ENV); BA, Philosophy, University of Michigan, 1966; MS, Educational Psychology, California State University at Hayward, 1978; PhD, Management Information Systems, University of Arizona, 1988. Dr. Heminger's research interests include information integration, strategic information management, computer supported group problem-solving, reengineering, and long-term access to information. Tel. 937-255-3636 x7405 (DSN 785-3636 x7405), email: [Alan.Heminger@afit.edu](mailto:Alan.Heminger@afit.edu)

**SPONSOR FUNDED RESEARCH PROJECTS**

"Future Needs for Deployment of Combat Comm." Sponsor: 689 CCW. Funding: \$15,000.

**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](mailto:David.Jacques@afit.edu)

**SPONSOR FUNDED RESEARCH PROJECTS**

"Integrated Systems Health Management." Sponsor: AFRL/RB. Funding: \$30,000 – Jacques 70%, Schubert Kabban 30%.

"Modular Systems for Rapid Integration of System-of-Systems Concepts." Sponsor: AFRL/RV. Funding: \$8,000.

**REFEREED JOURNAL PUBLICATIONS**

Stryker, A., D. Jacques, "Plug-and-Play Satellite or PnPSat – A Modularity Assessment," *AIAA Journal of Spacecraft and Rockets*, Vol. 49, No. 1, January 2012.

Ryan, E., D. Jacques and J. Colombi, "An Ontological Framework for Clarifying Flexibility-Related Terminology via Literature Survey," *INCOSE Journal of Systems Engineering*, 2012.

Ryan, E., D. Jacques, D. Ritschel and C. Schubert, "Characterizing the Accuracy of DOD Operating and Support Cost Estimates," *Journal of Public Procurement*, June 2012.

Pachter, M., Y. Choi, and D. Jacques, "Optimal Relay UAV Guidance: A New Differential Game," *Transactions on Control and Mechanical Systems*, May 2012. [ANT]

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

Clark, J.D. and D. Jacques, "Practical Measurement of Complexity in Dynamic Systems," *New Challenges in Systems Engineering and Architecting: Conference on Systems Engineering Research*, St. Louis, MO, 19-22 March, 2012.

Clark, J.D. and D. Jacques, "Flight Test Results for UAVs Using Boid Guidance Algorithms," *New Challenges in Systems Engineering and Architecting: Conference on Systems Engineering Research*, St. Louis, MO, 19-22 March, 2012. [ANT]

Ryan, E., D. Jacques, J. Colombi and C. Schubert, "A Proposed Methodology to Characterize the Accuracy of Life Cycle Cost Estimates for DOD Programs," *New Challenges in Systems Engineering and Architecting: Conference on Systems Engineering Research*, St. Louis, MO, 19-22 March, 2012.

Ryan, E., D. Jacques, D. Ritschel and C. Schubert, "Characterizing the Accuracy of DOD Operating and Support Cost Estimates," *Proceedings of the 22nd INCOSE International Symposium*, Rome, Italy, July, 2012.

#### **BOOKS AND CHAPTERS IN BOOKS**

Smith, D. and D. Jacques, "A Practical, Simplified Chemical Agent Sensor Placement Methodology," *Handbook of Emergency Management: A Human Factors and Systems Engineering Approach*, Taylor and Francis, 2012.

#### **JOHANNES, TAY W., Lt Col,**

Assistant Professor of Engineering Management, Department of Systems and Engineering Management, AFIT Appointment Date: Mar 2010 (AFIT/ENV); BS, Electrical Engineering, Montana State University, MT, 1990; MS, Engineering Management, Air Force Institute of Technology, Wright-Patterson AFB, OH, Mar 1999; Ph.D., Engineering Management, The George Washington University, DC, 2010. Lt Col Johannes' research interests include crisis and emergency management, organizational continuity, geographical information systems, and decision making. Tel. 937-255-3636 x4648 (DSN 785-3636 x4648), email: [Tay.Johannes@afit.edu](mailto:Tay.Johannes@afit.edu)

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

Lorimer, S., Feng, P., and Johannes, T. "Tactical Counterinsurgency Decision Tool for the Commander's Emergency Response Program," Forty-First Western Decision Science Institute Annual Conference, Hawaii, Apr 2012.

#### **LADD, DARIN A., Lt Col,**

Assistant Professor of Systems Engineering, 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, Information Systems, Washington State University, 2010. Lt Col Ladd's research interests include Strategic Decision Support, Public Entrepreneurship, Program Management, Mobile Computing, and Research Methods. Tel. 937-255-3636 x4574 (DSN 785-3636 x4574), email: [Darin.Ladd@afit.edu](mailto:Darin.Ladd@afit.edu)

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

Ladd, D.A., Valacich, J.S. *All Hell Breaks Loose: A Brittle DSS Meets a Discontinuous Environment*, Decision Sciences Institute Annual Meeting, Nov 2011 (1791-1796).

Ladd, D.A., Valacich, J.S., McNab, A. *A Low-velocity Industry Responds to A High-velocity Event*, Decision Sciences Institute Annual Meeting, Nov 2011 (2471-2476).

#### **OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES**

Referee for Information Systems Journal.

Referee for European Journal of Information Systems.

Graduate, Air War College (2012).

Deployment, Joint Cyber Center, United States Central Command, MacDill AFB, FL (Feb – Sep 2012).

Chief Systems Architect, USCENTCOM Cyber Situational/Common Operational Picture (2012).

**LANGHALS, BRENT T., Lt Col**

Assistant Professor of Engineering Systems, AFIT Appointment Date: 2011 (AFIT/ENV); BS, United States Air Force Academy, 1995; MS, Air Force Institute of Technology, 2001; PhD, University of Arizona, 2011. Lt Col Langhals' research interests include Human-Computer Interfaces, Systems Engineering, Vigilance, and Psychophysiological Cue Detection. Tel 937-255-3636 x4352 (DSN 785-3636 x4352), email: [Brent.Langhals@afit.edu](mailto:Brent.Langhals@afit.edu)

**REFEREED JOURNAL PUBLICATIONS**

Luna-Reyes, L. S., Derrick, D. C., Langhals, B.T., Nunamaker, J. F. (2012). Collaborative Cross-Border Security Infrastructure and Systems: Identifying Policy, Managerial and Technological Challenges. *International Journal of E-Politics*, Vol. 4, Issue 2.

Langhals, B. T., Burgoon, J. K., Nunamaker, J.F. (2012). *Using Head based Psychophysiological Cues to Enhance Screener Vigilance*. *Journal of Cognitive Engineering and Decision Making*, May 4.

**MCMURRAY, GARTH P., Maj**

Instructor of Systems Engineering, Department of Systems and Engineering Management, AFIT Appointment Date: 2011 (AFIT/ENV); BS, Computer Engineering, Oregon State University, 1998; MS, Systems Engineering, Air Force Institute of Technology, 2005; PhD candidate, Cognitive Systems Engineering, The Ohio State University. Major McMurray is completing his doctoral dissertation related to improving airport surface management performance through departure metering. Tel. 937-255-3636 x7409 (DSN 785-3636 x7409), email: [Garth.McMurray@afit.edu](mailto:Garth.McMurray@afit.edu)

**MILLER, MICHAEL E.,**

Assistant Professor of Systems Integration, Department of Systems and Engineering Management, AFIT Appointment Date: 2010 (AFIT/ENV); BS, Ohio University, 1987; MS, Ohio University, 1989; PhD, Industrial and Systems Engineering, Virginia Polytechnic Institute and State University, 1993. Dr. Miller's research interests include Human Systems Integration, Application of Human Vision to Display and Lighting Design and Systems Design for Light Emitting Diodes. Tel. 937-255-3636 x4651 (DSN 785-3636 x4651), email: [Michael.Miller@afit.edu](mailto:Michael.Miller@afit.edu)

**SPONSOR FUNDED RESEARCH PROJECTS**

"Applying MultiSpectral Imaging to Heart Rate Estimation." Sponsor: 711 HPW/RH. Funding: \$25,000 – Miller 50%, Clark 50%.

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

Ochs, K.S., Miller, M.E., and Thal, A. (2012). Time Valued Technology: Evaluating Infrastructure Replacement with Rapidly Emerging Technology, *Proceedings of the Industrial and Systems Engineering Research Conference*, Orlando, FL.

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

Gilman, J. and Miller, M.E. (2012). Daylight Matching with Blended-CCT LED Lamp, *Proceedings of the Society for Information Display*, Boston, MA.

Machuca, J., Miller, M.E., and Colombi, J. (2012). A Cognitive Task Analysis-based Evaluation of Remotely Piloted Aircraft Situation Awareness Transfer Mechanisms, IEEE International Multi-Disciplinary Conference on Cognitive Methods in Situation Awareness and Decision Support, New Orleans, LA.

Pond, T., Webster, B., Machuca, J., Colombi, J. Miller, M. and Gibb, R. (2012). Allocation of Communications to Reduce Mental Workload, Conference on Systems Engineering Research, St. Louis, MO.

#### PATENTS

Cok, R.S. and Miller, M.E. (2012) Converting three-component to four-component image, United States Patent 8,169,389.

Miller, M.E., Muszak, J.J. and Telek, M.J. (2012) Electronic device, display and touch-sensitive user interface, United States Patent 8,154,523.

Cok, R.S. and Miller, M.E. (2012) Electroluminescent area illumination with integrated mechanical switch, United States Patent 8,115,383.

Miller, M.E., Bietry, J.R. and Cok, R.S. (2012) Electro-luminescent display, United States Patent 8,144,084.

Miller, M.E. and Cok, R.S. (2012). Electro-luminescent area illumination device, United States Patent 8,136,961.

Cok, R.S. and Miller, M.E. (2012) Method for converting an input color signal, United States Patent 8,094,933.

Jin, E.W., Miller, M.E., Endrikhovski, S. and Cerosaletti, C.D. (2012) Stereoscopic display system with flexible rendering of disparity map according to the stereoscopic fusing capability of the observer, United States Patent 8,094,927.

Miller, M.E. and Hamer, J.W. (2011) Flexible multitouch electroluminescent display, United States Patent 8,072,437.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Gilman, J.M., Ochs, K.S., and Miller, M.E. (2011). "Changing the Light Bulb," Air Force Civil Engineer, 19(3), 20-21.

Conference Committee Member for 2012 Society for Information Display Conference (SID 2012).

Conference Committee Member for 2012 Conference on Systems Engineering Research (CSER 2012).

#### **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 fate of chemical warfare agents in the environment, nitrifying mixed cultures, and environmental microbiology analyses. Tel. 937-255-3636 x4711 (DSN 785-3636 x4711), email: [LeeAnn.Racz@afit.edu](mailto:LeeAnn.Racz@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

"Fate of Organophosphate Chemical Warfare Agents and Other Toxic Chemicals in a Municipal Wastewater Treatment Plant via Biodegradation in Activated Sludge." Sponsor: EPA. Funding: \$34,300.

#### REFEREED JOURNAL PUBLICATIONS

Racz, L., Muller, J.G., and Goel, R.K., Fate of Selected Estrogens in Two Laboratory Scale Sequencing Batch Reactors Fed with Different Organic Carbon Sources, *Bioresource Technology*, 110:35-41, 2012.

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

Willison, S., Racz, L., Schuldt, S.J., Walters, E., Fate of Organophosphate Chemical Warfare Agents (CWAs) in a Municipal Wastewater Treatment System, American Water Works Association Annual Conference and Exposition, Dallas, TX, June 2012.

Flory, J.R., Kanel, S.R., Racz, L., Impellitteri, C.A., Silva, R.G., and Goltz, M.N., Influence of pH on the Transport of Silver Nanoparticles in Saturated Porous Media: Laboratory Experiments and Modeling, 86<sup>th</sup> ACS Colloid and Surface Science Symposium, Baltimore, MD, June 2012.

Racz, L., A Systems Approach to Environmental Studies, Industrial and Systems Engineering Research Conference (ISERC), Orlando, FL, May 2012.

Kanel, S.R., Flory, J., Racz, L., Impellitteri, C.A., Nadagouda, M., Patterson, C., Silva, R.G., Huang, J., and Goltz, M.N., Fate and Transport of Silver Nanoparticles and Related Products in Saturated Porous Media (Poster), 243<sup>rd</sup> ACS National Meeting, San Diego, CA, March 2012.

Racz, L. and Friend, M.A., Keeping Graduate Education Relevant: Tying the Operational Air Force to the Classroom, Air Education Training Command Symposium, San Antonio, TX, January 2012.

Flory, J., Kanel, S.R., Racz, L., and Goltz, M.N., Transport of silver nanoparticles in saturated porous media: Experimental results and model simulations, Dayton Engineering Sciences Symposium, Fairborn, OH, October 2011.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Racz, L. and Harper, W., Emerging contaminants: why do we care what is in our wastewater? Invited to lecture during online webinar given to the Society of American Military Engineers, February 2012.

Invited as expert on national "Expert Workshop on Toxicity Testing of Water Undergoing Advanced Oxidation Processes Prior to Discharge," for the US Environmental Protection Agency and the Water Environment Research Foundation, 2012.

#### **RITSCHER, JONATHAN D., Lt Col,**

Assistant Professor of Cost Analysis, Department of Systems and Engineering Management, AFIT Appointment Date: 20011 (AFIT/ENV); BBA, Accountancy, University of Notre Dame, 1997; MS, Cost Analysis, Air Force Institute of Technology, Wright-Patterson AFB, OH, 2003; Ph.D., Economics, George Mason University, VA, 2011. Lt Col Ritscher's research interests include public choice, the effects of acquisition reforms on cost growth in DOD weapon systems, research and development cost estimation, and economic institutional analysis. Tel. 937-255-3636 x4441 (DSN 785-3636 x4441), email: [Jonathan.Ritscher@afit.edu](mailto:Jonathan.Ritscher@afit.edu)

#### **SCHECHTMAN, GREGORY M., Lt Col,**

Assistant Professor of Information Resource Management, Department of Systems and Engineering Management, AFIT Appointment Date: 2008 (AFIT/ENV). BS in Finance, Florida State University, 1990; MS in Information of Resource Management, Air Force Institute of Technology, Dayton, OH, 1996; PhD in Business Administration concentrating in Management Information Systems, Washington State University, 2009. Lt Col Schechtman's research interests include virtual collaboration, human computer interaction, and information security. Tel. 937-255-3636 x4709 (DSN 785-3636 x4709), email: [Gregory.Schechtman@afit.edu](mailto:Gregory.Schechtman@afit.edu)

**SHELLEY, MICHAEL L.,**

Professor of Environmental Science and Engineering, Department of Systems and Engineering Management, AFIT Appointment Date: 1996 (AFIT/ENV); BCE (Civil Engineering), Auburn University, 1974; MS (Environmental Engineering), Virginia Tech, 1975; PhD, Environmental Science and Engineering, University of North Carolina, 1985. Dr. Shelley focuses on system dynamics modeling in analyzing long-term management strategies. His research interests include abiotic and biochemical contaminant fate and transport, physiologically-based pharmacokinetic modeling, and ecological engineering design to optimize mission activity with environmental constraints. Tel. 937-255-3636 x7387 (DSN 785-3636 x7387), email: [Michael.Shelley@afit.edu](mailto:Michael.Shelley@afit.edu)

**SITZABEE, WILLIAM, E., Lt Col,**

Assistant Professor, Department of Systems and Engineering Management, AFIT Appointment Date: Jun 2009 (AFIT/ENV); BS, Civil Engineering, Norwich University, VT, 1993; MS, Engineering Management, Air Force Institute of Technology, Wright-Patterson AFB, OH, Mar 2004; Ph.D., Civil Engineering, North Carolina State University, NC, 2008. Lt Col Sitzabee's research interests include construction management, transportation asset management, geographical information systems, facility and infrastructure operations. Tel. 937-255-3636 x7395 (DSN 785-3636 x7395), email: [William.Sitzabee@afit.edu](mailto:William.Sitzabee@afit.edu)

**REFEREED JOURNAL PUBLICATIONS**

Sitzabee, W. & Taylor, R. "Professional Licensure: Is it an Air Force Ethical Requirement?," Journal of Professional Issues in Engineering Education and Practice, Volume 138, Number 2, Pages 99-103 (April 2012).

Gannon, T., Feng, P., and Sitzabee, W. "Reliable Schedule Forecasting in Federal Design-Build Facility Procurement," Lean Construction Journal, pp. 1-14 (January, 2012).

Mull, D. and Sitzabee, W. "Paint Pavement Marking Performance Prediction Model," Journal of Transportation, 138(5), 618-624, May 2012.

**THAL, ALFRED E., Jr.,**

Assistant Professor of Engineering Management, Department of Systems and Engineering Management, AFIT Appointment Date: 1998 (AFIT/ENV); BS, Civil Engineering, Texas Tech University, 1981; MS, Engineering Management, AFIT, 1985; PhD, Environmental Engineering, University of Oklahoma, 1999. Dr. Thal's research interests include engineering and environmental management, groundwater flow and remediation technologies, facility and infrastructure management, product development, sustainability and project management. Tel. 937-255-3636 x7401 (DSN 785-3636 x7401), email: [Al.Thal@afit.edu](mailto:Al.Thal@afit.edu)

**SPONSOR FUNDED RESEARCH PROJECTS**

"Environmental Remediation Acquisition Processes: Evaluation and Enhancement Recommendations."  
Sponsor: DOE. Funding: \$300,000 – Thal 75%, Ritschel 25%.

**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 deployed military waste/burn pit emissions and pharmacokinetic modeling of nanoparticle exposures. Other research interests include bioaerosol sampling, advanced composite material exposure assessment, and geospatial/plume dispersion modeling. Tel: 937-255-3636 x4511 (DSN 785-3636 x4511), email: [Dirk.Yamamoto@afit.edu](mailto:Dirk.Yamamoto@afit.edu)

#### REFEREED JOURNAL PUBLICATIONS

Woodall, B., D. Yamamoto, B. Gullett, A. Touati, "Emissions from Small-Scale Burning of Simulated Deployed U.S. Military Waste," *Environmental Science & Technology*, 2012.

Aurell, J., B. Gullett, D. Yamamoto, "Emissions from Open Burning of Simulated Solid Waste from Forward Operating Bases," *Environmental Science & Technology*, 2012.

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

Yamamoto, Dirk P., "Burning of Military Waste While Deployed," 2012 International Karasek Toxic Organic Pollutants Conference, May 2012.

Woodall, B. and D. Yamamoto, "Emissions from Simulated Open Burning of Deployed U.S. Military Waste," 2012 International Karasek Toxic Organic Pollutants Conference, May 2012.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

American Industrial Hygiene Association (AIHA) Continuing Education Committee.

University of Cincinnati Pilot Research Project (PRP) Steering Committee.

#### **WIRTHLIN, JOSEPH R., Lt Col,**

Associate Head, Strategic Communications, Department of Systems and Engineering Management, AFIT  
Appointment Date: 2009 (AFIT/ENV); BS, The United States Air Force Academy, 1994; MS, Massachusetts Institute of Technology, 2000; PhD, Engineering Systems, Massachusetts Institute of Technology, 2009. Lt Col Wirthlin's research interests include Product Development (New, Rapid, Complex Systems, Lean Product Development), Acquisition (DOD, US Air Force), Modeling and Simulation, Risk and Risk Management, Systems Engineering, Requirements, Project/Program Management, Management of Engineering, and Lean Thinking. Tel: 937-255-3636 x4650 (DSN 785-3636 x4650), email: [Joseph.Wirthlin@afit.edu](mailto:Joseph.Wirthlin@afit.edu)

#### SPONSOR FUNDED RESEARCH PROJECTS

"Composite Airframe Cost Estimation Model." Sponsor: NPS. Funding: \$120,000 – Wirthlin 50%, Badiru 50%.

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

Christensen, M., Wirthlin, J.R. (2012) A Method for Measuring Programmatic Dependency and Interdependency between DOD Acquisition Programs, *Proceedings of the ASME 2012 International Design Engineering Technical Conferences & Computers and Information in Engineering Conference*, Chicago, IL, August 12-15, 2012.

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

Soni, S.R., Al-Romaihi, M., Wirthlin, J.R., Badiru, A.B., Clay, S., Reliability Aspects in Z-Pinned Laminated Composites, *Proceedings of the 2012 International Conference on Industrial Engineering and Operations Management*, Istanbul, Turkey, July 3-6, 2012.

Rose, C., Wirthlin, J., Using M&S to maximize space satellite data collection with multiple ground stations, *Proceedings of the 2012 Conference on Systems Engineering Research*, St. Louis, MO 20 -22 March 2012.

Schreiner, M., Wirthlin, J., Challenges using modeling and simulation in architecture development, *Proceedings of the 2012 Conference on Systems Engineering Research*, St. Louis, MO 20 -22 March 2012.



Leach, D., Searle, C., Wirthlin, J., Houston, D., Acheson, P., Developing Simulator Support for Space Acquisitions, *Proceedings of the 2011 MODSIM World Conference and Expo*, Virginia Beach, VA, USA, October 11-14, 2011.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Wirthlin, J. (2012) Student Experiences in Lean from Class Projects. *2012 International Symposium of the International Council on Systems Engineering, Lean Systems Engineering Working Group*, Rome, Italy, 09-12 July 2012.

Wirthlin, J. (2012) Lean Enablers for Systems Engineering – Student Case Studies. *2012 International Workshop of the International Council on Systems Engineering, Lean Systems Engineering Working Group*, Tallahassee, FL, 21-24 January 2012.

Feng, P.P., Sitzabee, W.E., Thal, Jr., A.E., Wirthlin, J.R., Badiru, A.B., 2012 *System Engineering Efficiency Research (SEER), Phase I Research Report*, Air Force Institute of Technology, WPAFB, OH.

Representative to the International Council on Systems Engineering (INCOSE) Academic Advisory Council (2012 – present).

Track Chair (Complex Systems) for the 2012 Conference on Systems Engineering Research, St. Louis, MO, March 19-22, 2012.

2012 Sigma Iota Epsilon Instructor Award for Outstanding Contributions to the Understanding of Management Sciences.

Editorial Board, IEEE Systems Journal (2010 - present), Associate Editor.

Editorial Board, Journal of Enterprise Transformation (2009 – present).

## **6. RESEARCH CENTER PUBLICATIONS AND FUNDING INFORMATION**

The contents of this section are duplicated data, grouped by center. The information is previously listed within each project's specific academic department.

## 6.1. ADVANCED NAVIGATION TECHNOLOGY CENTER

### Advanced Navigation Technology (ANT) Center

Director 255-3636 x4580

Executive Administrator 255-3636 x4583

Laboratory Manager 255-3636 x4911

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

### 6.1.1 DOCTORAL DISSERTATIONS

EILDERS, MARTIN J., *Decentralized Riemannian Particle Filtering with Applications to Multi-Agent Localization*. AFIT/DEE/ENG/12-05. Faculty Advisor: Dr. John F. Raquet. Sponsor: AFRL/RW.

GUTIERREZ DEL ARROYO, JOSE R., *Passive Synthetic Aperture Radar Imaging Using Commercial OFDM Communication Networks*. AFIT/DEE/ENG/12-10. Faculty Advisor: Dr. Julie A. Jackson. Sponsor: AFRL/RV.

SHOCKLEY, JEREMIAH A., *Ground Vehicle Navigation Using Magnetic Field Variation*. AFIT/DEE/ENG/12-17. Faculty Advisor: Dr. John F. Raquet. Sponsor: N/A.

### 6.1.2 MASTER'S THESES

BUTLER, MICHAEL S., *Low Cost, Low Complexity Sensor Design for Non-Cooperative Geolocation via Received Signal Strength*. AFIT/GE/ENG/12-05. Faculty Advisor: Dr. Richard K. Martin. Sponsor: AFRL/RV.

CANCIANI, AARON J., *Integration of Cold Atom Interferometry INS with Other Sensors*. AFIT/GE/ENG/12-07. Faculty Advisor: Dr. John F. Raquet. Sponsor: AFSEO.

CASSEL, JERMENKO S., *Characterization of Global Positioning Systems (GPS) Coexisting with Wideband and Narrowband Signals*. AFIT/GE/ENG/12-09. Faculty Advisor: Dr. Michael A. Temple. Sponsor: AFRL/RV.

CICALE, RANDY S., *Cooperative Localization on Computationally Constrained Devices*. AFIT/GCO/ENG/12-04. Faculty Advisor: Maj Jeffrey M. Hemmes. Sponsor: N/A.

CORNN, PAUL A., *Spatial Identification of Passive Radio Frequency Identification Tags Using Software Defined Radios*. AFIT/GCE/ENG/12-04. Faculty Advisor: Maj Mark D. Silvius. Sponsor: AFRL/RV.

CURRO, JOSEPH A., II, *Automated Aerial Refueling Position Estimation Using a Scanning LiDAR*. AFIT/GE/ENG/12-11. Faculty Advisor: Dr. John F. Raquet. Sponsor: AFRL/RB.

ELSNER, DAVID L., *Universal Plug-n-Play Sensor Integration for Advanced Navigation*. AFIT/GE/ENG/12-12. Faculty Advisor: Lt Col Kenneth A. Fisher. Sponsor: N/A.

ENG, KWEE G., *Intelligent Behavioral Action Aiding for Improved Autonomous Image Navigation*. AFIT/GE/ENG/12-46. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: AFRL/RV.

ENGLISH, JACOB K., & MOLESWORTH, MICHAEL P., *Rapid Prototype Development of a Remotely-Piloted Aircraft Powered by a Hybrid-Electric Propulsion System*. AFIT/GSE/ENV/12-M02. Faculty Advisor: Dr. David R. Jacques. Sponsor: OSD.

FOLEY, BETHANY G., *A Dempster-Shafer Method for Multi-Sensor Fusion*. AFIT/GAM/ENC/12-03. Faculty Advisor: Dr. Aihua W. Wood. Sponsor: AFOSR.

GIACOMO, CHRISTOPHER, *Modeling, Simulation and Flight Test for Automatic Flight Control of the Condor Hybrid-Electric Remote Piloted Aircraft*. AFIT/GSE/ENV/12-M04. Faculty Advisor: Dr. David R. Jacques. Sponsor: OSD.

GIPSON, JONATHON S., *Air-to-Air Missile Enhanced Scoring with Kalman Smoothing*. AFIT/GE/ENG/12-18. Faculty Advisor: Lt Col Kenneth A. Fisher. Sponsor: ACC.

HUFFMAN, MICHAEL A., *The Effects of Cognitive Jamming on Wireless Sensor Networks Used for Geolocation*. AFIT/GE/ENG/12-21. Faculty Advisor: Dr. Richard K. Martin. Sponsor: AFRL/RV.

JURADO, JUAN D., *Enhanced Image-Aided Navigation Algorithm with Automatic Calibration and Affine Distortion Prediction*. AFIT/GE/ENG/12-23. Faculty Advisor: Lt Col Kenneth A. Fisher. Sponsor: DARPA.

KILLION, CHRISTOPHER B., *Augmenting the Global Positioning System with Foreign Navigation Systems and Alternative Sensors*. AFIT/GE/ENG/12-24. Faculty Advisor: Lt Col Michael J. Stepaniak. Sponsor: N/A.

LUDWIG, MATTHEW T., *UHF Antenna Design for AFIT Random Noise Radar*. AFIT/GE/ENG/12-28. Faculty Advisor: Dr. Peter J. Collins. Sponsor: N/A.

PADRO, JORGE G., *Development of a Star Tracker-Based Reference System for Accurate Attitude Determination of a Simulated Spacecraft*. AFIT/GAE/ENY/12-M32. Faculty Advisor: Dr. Eric D. Swenson. Sponsor: AFRL/RV.

PENN, TIMOTHY R., *All Source Sensor Integration Using an Extended Kalman Filter*. AFIT/GE/ENG/12-32. Faculty Advisor: Dr. John F. Raquet. Sponsor: DARPA.

PRILESZKY, ISTVAN M., *Cross Hallway Detection and Indoor Localization Using Flash Laser Detection and Ranging*. AFIT/GE/ENG/12-34. Faculty Advisor: Lt Col Michael J. Stepaniak. Sponsor: N/A.

RAPSON, MATTHEW B.P., *Passive Multistatic Radar Imaging Using an OFDM Based Signal of Opportunity*. AFIT/GE/ENG/12-35. Faculty Advisor: Julie A. Jackson. Sponsor: AFRL/RV.

RELYEA, ANDREW L., *Covariance Analysis of Vision Aided Navigation by Bootstrapping*. AFIT/GE/ENG/12-36. Faculty Advisor: Dr. Meir Pachter. Sponsor: AFRL/RW.

SWEENEY, NICHOLAS, *Air-to-Air Missile Vector Scoring*. AFIT/GE/ENG/12-38. Faculty Advisor: Lt Col Kenneth A. Fisher. Sponsor: 83 FWS.

VINCENT, OBA L., *Distributed Localization of Active Transmitters in a Wireless Sensor Network*. AFIT/GE/ENG/12-41. Faculty Advisor: Maj Mark D. Silvius. Sponsor: AFRL/RV.

### **6.1.3 FACULTY RESEARCH OUTPUT**

Notes: Faculty Bios can be found under their respective department listings. Shared credit for funding awards is indicated by the percentages shown for each faculty member associated with the project.

**BLACK, JONATHAN T., Department of Aeronautics and Astronautics**

#### **SPONSOR FUNDED RESEARCH PROJECTS**

“Characterizing MAV Wings in Flight.” Sponsor: AFOSR. Funding: \$45,000.

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

Doyle, D.D., Black, J.T., "Determination of Feature Generation Methods for PTZ Camera Object Tracking," Proceedings of SPIE Vol. 8395, Acquisition, Tracking, Pointing, and Laser Systems Technologies XXVI, May 2012, ISBN: 9780819490735.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

36th AIAA Dayton-Cincinnati Aerospace Sciences Symposium (DCASS) General Chair, Mar. 2012.

**BORGHETTI, BRETT J., Lt Col, Department of Electrical and Computer Engineering**

#### REFEREED JOURNAL PUBLICATIONS

Weissgerber, K., Lamont, G.B., Borghetti, B.J., and Peterson, G.L., "Determining Solution Space Characteristics for Real Time Strategy Games & Characterizing Winning Strategies," *Computer Games Technology Journal*, Vol. 2011, 2011, pp. 1-17. DOI:10.1155/2011/834026.

**COBB, RICHARD G., Department of Aeronautics and Astronautics**

#### SPONSOR FUNDED RESEARCH PROJECTS

"Automatic Ground Collision Avoidance System Trajectory Optimization." Sponsor: AFRL/RB. Funding: \$12,000.

#### REFEREED JOURNAL PUBLICATIONS

David H. Curtis, Mark F. Reeder, Craig E. Svanberg, Richard G. Cobb, and Gregory H. Parker "Flapping Wing Micro Air Vehicle Bench Test Setup," *IJMAV* Volume 4, Number 1, March 2012.

Anderson, M. and Cobb, R., "Toward Flapping Wing Control of Micro Air Vehicles," *Journal of Guidance, Control and Dynamics*, Feb 2012.

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

Lindholm, G., Ohara, Cobb, R., and Reeder, M., "Power Requirements for Control of Flapping Wing Micro Air Vehicle using Piezoelectric Actuators," Proceedings of the 50th AIAA Aerospace Sciences Meeting, Orlando, FL, Jan 2012.

**FISHER, KENNETH A., Lt Col, Department of Electrical and Computer Engineering**

#### SPONSOR FUNDED RESEARCH PROJECTS

"Hybrid Sensor Fusion for Autonomous Applications." Sponsor: AFOSR. Funding: \$30,929 – Fisher 75%, Pachter 25%.

"Increased Understanding of Vision-Aided Navigation Uncertainty Estimates." Sponsor: AFRL/RV. Funding: \$14,549 – Fisher 80%, Raquet 20%.

#### REFEREED JOURNAL PUBLICATIONS

Fisher, K. A. and J. F. Raquet, "Non-GPS Precision Position, Navigation, and Timing," *Air and Space Power Journal, Chinese*, Vol. 5, No. 3, pp. 45-53, Fall 2011.

Fisher, K. A. and J. F. Raquet, "Non-GPS Precision Position, Navigation, and Timing," *Air and Space Power Journal, Spanish*, Fourth Quarter, pp. 87-96, Fall 2011.

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

Fisher, K., J. Raquet, and J. Kresge, "Affine Feature Matching via Stochastic Prediction," Proceedings of 25<sup>th</sup> International Technical Meeting of The Satellite Division of the Institute of Navigation (ION GNSS 2012), Nashville, TN, 2012.

Jurado, J. and K. Fisher, "Automatic Camera Calibration," *7th Annual Dayton Engineering Sciences Symposium (DESS 2011)*, Dayton, OH, Oct 2011.

Foley, B., A. Wood, and K. Fisher, "Dempster Shafer Estimation Techniques for Navigation," *37th Dayton-Cincinnati Aerospace Sciences Symposium (DCASS)*, Mar 2012.

Sweeney, N. and K. Fisher, "Air-to-Air Missile Tracking using COTS Sensors," *2012 Joint Navigation Conference (JNC)*, Colorado Springs, Colorado, June 2012.

Foley, B., A. Wood, and K. Fisher, "A Dempster-Shafer Method for Multi-Sensor Fusion," *2012 Joint Navigation Conference (JNC)*, Colorado Springs, Colorado, June 2012.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Served as Subject Matter Expert to DARPA on All Source Positioning and Navigation Program.

Served as Signals of Opportunity Navigation Subject Matter Expert for Dr. Jon Sjogren, AFOSR.

Session Chair for DESS 2011 (Oct 2011).

Session Chair for ION GNSS 2011 (Oct 2011).

Session Chair for ION JNC 2012 (June 2012).

AFOSR proposal reviewer for Dr. Jon Sjogren (area: signals of opportunity navigation).

#### **HAKER, MARSHALL E., Maj, Department of Electrical and Computer Engineering**

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

M. Haker, J. Raquet, "Applying Detection Theory to Define Stopping Criteria for the Signal Decomposition and Parameterization Algorithm," International Conference on Localization and GNSS 2012, Stanrberg, Germany, Jun 2012.

M. Haker and J. Raquet, "Estimating Multipath in GNSS Signals Through a Novel Stochastic Search and Decomposition Algorithm," Proceedings of 24<sup>th</sup> International Technical Meeting of The Satellite Division of the Institute of Navigation (ION GNSS 2011), Portland, OR, 2011, pp. 1162-1172.

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

M. Haker and J. Raquet, "Tracking Multipath in Received GNSS Signals through use of a Signal Decomposition and Parameterization Algorithm," Proceedings of 25<sup>th</sup> International Technical Meeting of The Satellite Division of the Institute of Navigation (ION GNSS 2012), Nashville, TN, 2012.

**HODSON, DOUGLAS D., Department of Electrical and Computer Engineering**

SPONSOR FUNDED RESEARCH PROJECTS

“Software Architecture, Human Behavioral Modeling and Experimental Design Research.” Sponsor: ASC.  
Funding: \$100,000.

**HOPKINSON, KENNETH M., Department of Electrical and Computer Engineering**

SPONSOR FUNDED RESEARCH PROJECTS

“Technical Support: Cognitive and Mobile Networks.” Sponsor: AFRL/RI. Funding: \$90,000.

“A Context-Aware Approach for Enabling Large-Scale Mobile Networks.” Sponsor: AFOSR. Funding:  
\$43,040.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Knight, M.P., Raulston, K., Laviers, K.R., Hopkinson, K.M., “The Use of Artificial Intelligence for Enhanced Network Defense,” *IEEE International Defense and Homeland Security Simulation Workshop (DHSS)*, 19-21.

**JACKSON, JULIE A., Department of Electrical and Computer Engineering**

REFEREED JOURNAL PUBLICATIONS

J. A. Jackson and R. L. Moses, “Synthetic Aperture Radar 3D Feature Extraction for Arbitrary Flight Paths,” *IEEE Trans. on Aerospace and Electronic Systems*, Vol. 48, No. 3, pp. 2065-2084, July 2012.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

J. A. Jackson, M. Rapson, and J. Gutierrez, “Passive Multi-Static SAR using OFDM Signals of Opportunity,” MSS Tri-Service Radar Conference, Boulder, CO, June 18-22, 2012, TP12 pp. 1-15.

J. Gutierrez and J. A. Jackson, “Range Profiles from an Experimental OFDM Passive Radar,” 2012 International Waveform Diversity and Design Conference, Kauai, Hawaii, January 2012, paper 7023, pp. 1-5.

D. F. Fuller, D. E. Hack, S. Sutara, A. Tempelis, M. Jussaume, M. A. Saville, and J. A. Jackson, “Integrating electromagnetics and signal processing into new radar algorithms,” (*invited paper*) International Conference on Electromagnetics in Advanced Applications (ICEAA), 2011, pp. 1330-1333.

**JACQUES, DAVID R., Department of Systems and Engineering Management**

REFEREED JOURNAL PUBLICATIONS

Pachter, M., Y. Choi, and D. Jacques, “Optimal Relay UAV Guidance: A New Differential Game,” *Transactions on Control and Mechanical Systems*, May 2012.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Clark, J.D. and D. Jacques, “Flight Test Results for UAVs Using Boid Guidance Algorithms,” *New Challenges in Systems Engineering and Architecting: Conference on Systems Engineering Research*, St. Louis, MO, 19-22 March, 2012.

**LAMONT, GARY B., Department of Electrical and Computer Engineering**

REFEREED JOURNAL PUBLICATIONS

Weissgerber, K., Lamont, G.B., Borghetti, B.J., and Peterson, G.L., "Determining Solution Space Characteristics for Real Time Strategy Games & Characterizing Winning Strategies," *Computer Games Technology Journal*, Vol. 2011, 2011, pp. 1-17. DOI:10.1155/2011/834026.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Jeremy Stringer, Gary Lamont, and Geoffrey Akers, "Multi-Objective Evolutionary Algorithm Determined Radar Phase Codes," *IEEE Radar Conference*, ISBN 978-1-4673-0658-4, pp. 161-166, May, 2012.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Technical Chair, IEEE National Aerospace and Electtroinciss Conference (NAECON), Dayton, Ohio, July 25-27, 2012.

**MARTIN, RICHARD K., Department of Electrical and Computer Engineering**

SPONSOR FUNDED RESEARCH PROJECTS

"Distributed TDOA-Based Source Localization." Sponsor: AFOSR. Funding: \$32,171 – Martin 50%, Fisher 50%.

REFEREED JOURNAL PUBLICATIONS

R. K. Martin, "Using Alpha Shapes to Approximate Signal Strength Based Positioning Performance," *IEEE Signal Processing Letters*, Vol. 18, No. 12, December 2011, pp. 741-744.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

A. S. King and R. K. Martin, "The Benefits of Game Use in a Signal Processing Graduate Class," submitted to *Proc. Int'l. Conf. on Acoustics, Speech, and Signal Processing*, Kyoto, Japan, Mar 2012.

R. K. Martin, "How Valid is the Regularly-Spaced Grid Assumption in RSS Source Localization Sensor Networks?," in *Proc. IEEE Workshop on Statistical Signal Processing*, Ann Arbor, MI, Aug 2012, 4 pages.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

R. Lenahan, B. Christel, C. Lawyer, and R. K. Martin, "Radio Tomographic Imaging and Geolocation Using Sun Spots," poster presentation at *IEEE SENSORS 2011 Conf.*, Limerick, Ireland, Oct 2011.

M. Butler, R. K. Martin, and R. Lenahan, "Low Cost Sensor Design for Non-Cooperative Geolocation via RSS," poster presentation at *European Conference on Wireless Sensor Networks*, Trento, Italy, Feb 2012.

PATENTS

Richard K. Martin, Jamie S. Velotta, and John F. Raquet, "Multicarrier Modulation Navigation with a Signal of Opportunity," United States Patent #8072383, issued on 06 Dec 2011.



**OXLEY, MARK E., Department of Mathematics and Statistics**

**SPONSOR FUNDED RESEARCH PROJECTS**

“Nonlinear-Nonconvex Compressive Sensing.” Sponsor: AFRL/RI. Funding: \$35,000.

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

Culbertson, J., K. Sturtz and M.E. Oxley, Representations of probabilistic situations, *Proceedings of SPIE, Signal Processing, Sensor Fusion, and Target Recognition XXI* **8392** (2012), paper 36.

Oxley, M., J. Fitch, C. Schubert Kabban, Feature fusion of detection systems via their ROC functions, *Proceedings of SPIE, Signal Processing, Sensor Fusion, and Target Recognition XXI* **8392** (2012), paper 37.

Fitch, J., M. Oxley, and C. Schubert Kabban, Label fusion of classification systems via their ROC functions, *Proceedings of SPIE, Signal Processing, Sensor Fusion, and Target Recognition XXI* **8392** (2012), paper 38.

**OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES**

Oxley, M., “Information Fusion,” Pacific Northwest National Laboratories, Richland, WA, May, 2012.

**PACHTER, MEIR, Department of Electrical and Computer Engineering**

**SPONSOR FUNDED RESEARCH PROJECTS**

“Decision Support Techniques.” Sponsor: AFRL/RV. Funding: \$10,000.

“Cooperative Control.” Sponsor: AFRL/RB. Funding: \$20,000.

“Games, Information and Deception Exploitation for Adversarial Network Systems.” Sponsor: AFOSR. Funding: \$52,415.

**REFEREED JOURNAL PUBLICATIONS**

M. Pachter, “Kalman Filtering When the Large Bandwidth Control is Not Known,” IEEE Trans. on Aerospace and Electronic Systems, Vol. 48, No. 1, January 2012, pp. 542-551.

M. Pachter, “Kalman Filtering When the Large Bandwidth Control is Not Known,” IEEE Trans. On Aerospace and Electronic Systems, Vol. 48, No. 1, January 2012, pp. 542-551.

K. Krishnamoorthy, P. Chandler, M. Pachter and S. Dharba, “Optimization of Perimeter Patrol Operations Using Unmanned Aerial Vehicles,” AIAA Journal of Guidance, Control and Dynamics, Vol. 35 No. 2, March-April 2012, pp. 434-441.

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

M. Pachter, “The Informativeness of Discrete Measurements,” 52st Israel Annual Conference on Aerospace Sciences, Haifa, Israel, February 29-March 1 2012.

K. Kalyanam, M. Pachter and P. Chandler, “Optimal UAV Search for a Random Moving Ground Target,” AIAA Infotech Aerospace 2012, 19-21 June 2012, Garden Grove, CA.

K. Kalyanam, S. Dharba, M. Pachter and P. Chandler, "Bounding Procedures for Stochastic Dynamic Programs with Applications to the Perimeter Patrol Problem," American Control Conference, Paper FrB18.4, Montreal, Canada, June 27-29, 2012.

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

"Information, Decentralization and Autonomy in Networked Systems," International Conference on the Dynamics of Information Systems, Gainesville, FL, 20-22 February 2012.

"UAV Search & Capture of a Moving Ground Target," GIDEANS Review, Boston, MA, April 12, 2012.

#### BOOKS AND CHAPTERS IN BOOKS

M. Pachter and K. Pham, "Information Patterns in Discrete-Time Linear-Quadratic Dynamic Games," in *Sensors: Theory, Algorithms and Applications*, P.M. Pardalos, V. Boginski, C. Commander and Y. Ye, Eds., Springer, August 2012, pp. 61-94.

K. Pham and M. Pachter, "Information Considerations in Multi-Person Cooperative Control/Decision Problems: Information Sets, Sufficient Information Flows and Risk Averse Decision Rules for Performance Robustness," in *Sensors: Theory, Algorithms and Applications*, P.M. Pardalos, V. Boginski, C. Commander and Y. Ye, Eds., Springer, August 2012.

K. Pham and M. Pachter, "Modeling Interactions in Complex Systems: Self-Coordination, Game -Theoretic Design Protocols, and Performance-Reliability Aided Decision Making," in *Sensors: Theory, Algorithms and Applications*, P.M. Pardalos, V. Boginski, C. Commander and Y. Ye, Eds., Springer, August 2012.

**PETERSON, GILBERT L., Department of Electrical and Computer Engineering**

#### SPONSOR FUNDED RESEARCH PROJECTS

"Maximization of Observability in Navigation for Autonomous Robotic Control (MONARC)." Sponsor: AFRL/RV. Funding: \$54,887 – Peterson 80%, Raquet 20%.

#### REFEREED JOURNAL PUBLICATIONS

Peterson, G.L., Hooper, D.J., and Duffy, J., "Dynamic Behavior Sequencing for Hybrid Robot Architectures," *Journal of Intelligent and Robotic Systems*, Vol. 64, No. 2, 2011, pp. 179-196, DOI: 10.1007/s10846-010-9535-3.

Weissgerber, K., Lamont, G.B., Borghetti, B.J., and Peterson, G.L., "Determining Solution Space Characteristics for Real Time Strategy Games & Characterizing Winning Strategies," *Computer Games Technology Journal*, Vol. 2011, 2011, pp. 1-17. DOI:10.1155/2011/834026.

**RAQUET, JOHN F., Department of Electrical and Computer Engineering**

#### SPONSOR FUNDED RESEARCH PROJECTS

"Use of Pseudolite Approach for Alternative PNT." Sponsor: FAA. Funding: \$50,000 – Raquet 34%, Jacques 33%, Mann 33%.

"ANT Center Laboratory Support per Attachment 6 of the MOA between AFIT and AFRL." Sponsor: AFRL/RV. Funding: \$200,000 – Raquet 50%, Fisher 50%.

"ANT Center Laboratory Support per Attachment 6 of the MOA between AFIT and AFRL." Sponsor: AFRL/RW. Funding: \$100,000 – Raquet 50%, Fisher 50%.

“Ultra-High Accuracy Reference Systems (UHARS) Support.” Sponsor: 746 TS. Funding: \$140,000 – Raquet 90%, Fisher 10%.

“Development of Electronic Warfare (EW) Trainer.” Sponsor: AFRL/RV. Funding: \$49,000.

“Support for All-Source Positioning and Navigation (ASPN) Program Phase II.” Sponsor: DARPA. Funding: \$75,000 – Raquet 60%, Fisher 30%, Peterson 10%.

#### REFEREED JOURNAL PUBLICATIONS

K. Kauffman, J. Raquet, J. Morton, D. Garmatyuk, “Real-Time UWB-OFDM Radar Based Navigation in Unknown Terrain,” IEEE Transactions on Aerospace and Electronic Systems, Feb 2012.

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

M. Haker, J. Raquet, “Applying Detection Theory to Define Stopping Criteria for the Signal Decomposition and Parameterization Algorithm,” International Conference on Localization and GNSS 2012, Stanrberg, Germany, Jun 2012.

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

M. Haker and J. Raquet, “Tracking Multipath in Received GNSS Signals through use of a Signal Decomposition and Parameterization Algorithm,” Proceedings of 25<sup>th</sup> International Technical Meeting of The Satellite Division of the Institute of Navigation (ION GNSS 2012), Nashville, TN, 2012.

Kauffman, K., J. Raquet, J. Morton, D. Garmatyuk, “Experimental Study of UWB-OFDM SAR for Indoor Navigation with INS Integration,” Proceedings of 25<sup>th</sup> International Technical Meeting of The Satellite Division of the Institute of Navigation (ION GNSS 2012), Nashville, TN, 2012.

Shockley, J. and J. Raquet, “Three Axis Magnetometer Navigation in Suburban Areas,” Proceedings of 25<sup>th</sup> International Technical Meeting of The Satellite Division of the Institute of Navigation (ION GNSS 2012), Nashville, TN, 2012.

Fisher, K., J. Raquet, and J. Kresge, “Affine Feature Matching via Stochastic Prediction,” Proceedings of 25<sup>th</sup> International Technical Meeting of The Satellite Division of the Institute of Navigation (ION GNSS 2012), Nashville, TN, 2012.

Calhoun, S., J. Curro, and J. Raquet, “Flight Test Evaluation of Predictive Rendering Image Navigation for Close-Formation Flight,” Proceedings of 25<sup>th</sup> International Technical Meeting of The Satellite Division of the Institute of Navigation (ION GNSS 2012), Nashville, TN, 2012.

Curro, J., T. Pestak, M. Smearcheck, J. Kresge, and J. Raquet, “Automated Aerial Refueling Using Scanning LiDAR,” Proceedings of 25<sup>th</sup> International Technical Meeting of The Satellite Division of the Institute of Navigation (ION GNSS 2012), Nashville, TN, 2012.

#### PATENTS

Martin, R., J. Velotta, and J. Raquet, “Navigation and Position Determination with a Multicarrier Modulation Signal of Opportunity,” Patent No. 8,072,383, Issued 6 Dec, 2011.

Morrison, J., J. Raquet, and M. Veth, “Coded Aperture Aided Navigation and Geolocation System,” Application No. 13/015,272, Notice of Allowance issued Apr 2012.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Raquet, J. and J. Campbell, “GPS 101,” Tutorial taught to 70 attendees of 2012 Joint Navigation Conference, Jun 2012.

Raquet, J., “Calculation of GPS PNT Solution,” presented to 53 industrial members and students from COUNT consortium, Jun 2012.

Raquet, J., “Fundamentals of GPS Navigation and Receiver Processing,” presented to 60 professors and students at Workshop on Science Application of GNSS in Developing Countries, Trieste, Italy, Apr 2012.

J. Shockley and J. Raquet, “Vehicle Mounted Magnetometer Measurements for Navigation,” presented at 2012 Joint Navigation Conference (JNC), Colorado Springs, CO, Jun 2012.

DARPA, Consulting support for S-BUG and RSN navigation programs, Jan 2009 – present.

Chairman, Institute of Navigation (ION) Satellite Division.

Scientific (organizing) committee, International Conference on Ubiquitous Positioning, Indoor Navigation and Location-Based Service, Helsinki, Finland, Oct 2012.

Awards Committee Member, Institute of Navigation.

#### **REEDER, MARK F., Department of Aeronautics and Astronautics**

#### SPONSOR FUNDED RESEARCH PROJECTS

“Design and Test of Flapping-Wing Micro Air Vehicles.” Sponsor: AFRL/RB. Funding: \$60,000 – Reeder 25%, Cobb 25%, Black 25%, Palazotto 25%.

#### **SAMBORA, MATTHEW D., Col, Department of Electrical and Computer Engineering**

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Department of Defense Space Experiments Review Board - Member.

IEEE Aerospace Conference, Image Processing Session Co-Chair.

## 6.2. CENTER FOR CYBERSPACE RESEARCH

### Center for Cyberspace Research (CCR)

Director 255-6565 x4445

Associate Director 255-6565 x7105

Executive Program Coordinator 255-3636 x4602

Homepage: <http://www.afit.edu/ccr/>

### 6.2.1 DOCTORAL DISSERTATIONS

BRYANT, ADAM R., *Understanding How Reverse Engineers Make Sense of Programs from Assembly Language Representations*. AFIT/DCS/ENG/12-01. Faculty Advisor: Dr. Robert F. Mills.  
Sponsor: AFRL/R.Y.

COBB, WILLIAM E., *Exploitation of Unintentional Information Leakage from Integrated Circuits*. AFIT/DEE/ENG/11-06. Faculty Advisor: Dr. Rusty O. Baldwin. Sponsor: NSA.

KUCIAPINSKI, KEVIN S., *Operational Application of RF Distinct Native Attribute (RF-DNA) Fingerprinting to Commercial SATCOM Devices*. AFIT/DEE/ENG/12-15. Faculty Advisor: Dr. Michael A. Temple. Sponsor: AFRL/R.Y.

### 6.2.2 MASTER'S THESES

ADAMS, THOMAS C., *Empirical Analysis of Optical Attenuator Performance in Quantum Key Distribution Systems Using a Particle Model*. AFIT/GCS/ENG/12-01. Faculty Advisor: Lt Col Jeffrey W. Humphries.  
Sponsor: LTS.

BADENHOP, CHRISTOPHER W., *A Black Hole Attack Model for Reactive Ad-Hoc Protocols*. AFIT/GCO/ENG/12-01. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: AFRL/R.Y.

BALDASSARI, KYLE M., *Considerations for Employment of Defensive Counter Cyberspace Forces for Hunter Operations*. AFIT/ICW/ENG/12-01. Faculty Advisor: Dr. Robert F. Mills. Sponsor: N/A.

BARRON, JOHN W., *RSA Power Analysis Obfuscation: A Dynamic FPGA Architecture*. AFIT/GE/ENG/12-02. Faculty Advisor: Maj Todd R. Andel. Sponsor: AFOSR.

BERMAN, DUSTIN, *Emulating Industrial Control System Field Devices Using Gumstix Technology*. AFIT/GCO/ENG/12-13. Faculty Advisor: Maj Jonathan W. Butts. Sponsor: DHS.

BRODBECK, ROBERT C., *Covert Android Rootkit Detection: Evaluating Linux Kernel Level Rootkits on the Android Operating System*. AFIT/GCO/ENG/12-14. Faculty Advisor: Dr. Rusty O. Baldwin. Sponsor: N/A.

BROWN, BRANDON A., *An FPGA Noise Resistant Digital Temperature Sensor with Auto Calibration*. AFIT/GCE/ENG/12-02. Faculty Advisor: Maj Todd R. Andel. Sponsor: AFOSR.

BUSHEY, HENRY W., *Towards Quantifying Programmable Logic Controller Resilience Against Intentional Exploits*. AFIT/GCO/ENG/12-03. Faculty Advisor: Maj Jonathan W. Butts. Sponsor: DHS.

CASSEL, JERMENKO S., *Characterization of Global Positioning Systems (GPS) Coexisting with Wideband and Narrowband Signals*. AFIT/GE/ENG/12-09. Faculty Advisor: Dr. Michael A. Temple.  
Sponsor: AFRL/R.Y.

CICALE, RANDY S., *Cooperative Localization on Computationally Constrained Devices*. AFIT/GCO/ENG/12-04. Faculty Advisor: Maj Jeffrey M. Hemmes. Sponsor: N/A.

COMPTON, ANDREW J., *Workload-Based Automated Interface Mode Selection*. AFIT/GCE/ENG/12-03. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: N/A.

CRAWFORD, MARTIN H., *Insider Threat Detection on the Windows Operating System Using Virtual Machine Introspection*. AFIT/GCO/ENG/12-15. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: NSA.

ENG, KWEE G., *Intelligent Behavioral Action Aiding for Improved Autonomous Image Navigation*. AFIT/GE/ENG/12-46. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: AFRL/RV.

FRITZKE, AUSTIN W., *Obfuscating Against Side-Channel Power Analysis Using Hiding Techniques for AES*. AFIT/GE/ENG/12-15. Faculty Advisor: Maj Todd R. Andel. Sponsor: AFOSR.

GERICS, SCOTT E., *Intra-Procedural Path-Insensitive Grams (i-grams) and Disassembly Based Features for Packer Tool Classification and Detection*. AFIT/GCE/ENG/12-07. Faculty Advisor: Dr. Rusty O. Baldwin. Sponsor: N/A.

GILBERT, JOSEPH I., *Scalable Wavelet-Based Active Network Stepping Stone Detection*. AFIT/GE/ENG/12-17. Faculty Advisor: Lt Col David J. Robinson. Sponsor: N/A.

GILLIGAN, MARTIN A., *Magnesium Object Manager Sandbox, A More Effective Sandbox Method for Windows 7*. AFIT/GCE/ENG/12-05. Faculty Advisor: Lt Col Jeffrey W. Humphries. Sponsor: N/A.

GUBLER, TYRONE C., *The White-Hat Bot: A Novel Botnet Defense Strategy*. AFIT/GCS/ENG/12-05. Faculty Advisor: Lt Col Jeffrey M. Hemmes. Sponsor: N/A.

HAGEN, JOHN T., *Vulnerability Analysis of the Player Command and Control Protocol*. AFIT/GCO/ENG/12-16. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: AFRL/RV.

HAY, ANDREW F., *Forensic Memory Analysis for Apple OS X*. AFIT/GCO/ENG/12-17. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: AFRL/RI.

HELFEN, JOSHUA D., *Satellite Security: State Analysis Based Command Evaluation*. AFIT/GCO/ENG/12-05. Faculty Advisor: Lt Col Jeffrey W. Humphries. Sponsor: N/A.

HERSACK, JONATHAN D., *Utilizing Graphics Processing Units for Network Anomaly Detection*. AFIT/GCO/ENG/12-24. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: N/A.

JOHNSON, JAMES S., *An Analysis of Error Reconciliation Protocols for Use in Quantum Key Distribution*. AFIT/GCE/ENG/12-06. Faculty Advisor: Lt Col Jeffrey W. Humphries. Sponsor: LTS.

KILLPACK, SHAWN O., *Radio Frequency Distinct Native Attribute (RF-DNA) Fingerprinting Applied to Commercial SATCOM Devices*. AFIT/GE/ENG/12-25. Faculty Advisor: Dr. Michael A. Temple. Sponsor: AFRL/RV.

KOZIEL, ERIC A., *Effects of Architecture on Information Leakage of a Hardware Advanced Encryption Standard Implementation*. AFIT/GCO/ENG/12-25. Faculty Advisor: Dr. Rusty O. Baldwin. Sponsor: AFRL/RV.

LARKIN, ROBERT D., *Evaluation of Traditional Security Solutions in the SCADA Environment*. AFIT/GCO/ENG/12-06. Faculty Advisor: Maj Jonathan W. Butts. Sponsor: DHS.

MAGAZU, DOMENIC III, *Exploiting the Automatic Dependent Surveillance-Broadcast System via False Target Injection*. AFIT/GCO/ENG/12-07. Faculty Advisor: Dr. Robert F. Mills. Sponsor: N/A.

MASTERS, GREGORY P., *Evaluation of Malware Target Recognition Deployed in a Cloud-Based Fileserver Environment*. AFIT/GCO/ENG/12-08. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: N/A.

MCMINN, LUCILLE R., *External Verification of SCADA System Embedded Controller Firmware*. AFIT/GCS/ENG/12-02. Faculty Advisor: Maj Jonathan W. Butts. Sponsor: DHS.

MERRIT, ERIC J., *Creating Network Attack Priority Lists by Analyzing Email Traffic Using Predefined Profiles*. AFIT/GCO/ENG/12-19. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: N/A.

MILLER, CASEY C., *Cyberspace and Real-World Behavioral Relationships: Towards the Application of Internet Search Queries to Identify Individuals At-Risk for Suicide*. AFIT/GCE/ENG/12-08. Faculty Advisor: Maj Jonathan W. Butts. Sponsor: N/A.

MILLER, JONATHAN D., *Binary Disassembly Block Coverage by Symbolic Execution vs. Recursive Descent*. AFIT/GCO/ENG/12-09. Faculty Advisor: Dr. Rusty O. Baldwin. Sponsor: N/A.

MORABITO, DANIEL B., *Detecting Hardware-Assisted Hypervisor Rootkits within Nested Virtualized Environments*. AFIT/GCO/ENG/12-20. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: AFRL/RI.

OLIPANE, ROBERT J., *Short Message Service (SMS) Command and Control (C2) Awareness in Android-Based Smartphones Using Kernel-Level Auditing*. AFIT/GCO/ENG/12-21. Faculty Advisor: Dr. Robert F. Mills. Sponsor: N/A.

PACER, BENHUR E., *Process Flow Features as a Host-Based Event Knowledge Representation*. AFIT/GCS/ENG/12-06. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: AFRL/RI.

ROSS, KEITH J., *Application of Game Theory to Improve the Defense of the Smart Grid*. AFIT/GCO/ENG/12-10. Faculty Advisor: Dr. Kenneth M. Hopkinson. Sponsor: AFOSR.

SIEVERS, MATTHEW D., *Data Exfiltration Detection Performance Analysis Using Dedicated Deep Packet Inspection*. AFIT/GCO/ENG/12-11. Faculty Advisor: Dr. Robert F. Mills. Sponsor: N/A.

STEELE, MATTHEW F., *Security Verification of Secure MANET Routing Protocols*. AFIT/GCS/ENG/12-03. Faculty Advisor: Maj Todd R. Andel. Sponsor: AFOSR.

STOUT, WILLIAM M.S., *Network Performance of Access Control Policies in a Tactical Environment*. AFIT/GCE/ENG/12-09. Faculty Advisor: Dr. Rusty O. Baldwin. Sponsor: AFRL/RY.

WOLF, ANDRE, *A Performance Analysis of the Optimized Link State Routing Protocol Using Voice Traffic Over Mobile Ad Hoc Networks*. AFIT/GE/ENG/12-44. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: N/A.

### **6.2.3 GRADUATE RESEARCH PAPERS**

BIXBY, ERIC R., *An Analysis of the Computer Security Ramifications of Weakened Asymmetric Cryptographic Algorithms*. AFIT/ICW/ENG/12-02. Faculty Advisor: Dr. Robert F. Mills. Sponsor: N/A.

BUTLER, MATT J., *Rapid Delivery of Cyber Capabilities: Evaluation of the Requirement for a Rapid Cyber Acquisition Process*. AFIT/ICW/ENG/12-03. Faculty Advisor: Maj Jonathan W. Butts. Sponsor: N/A.

WIMMER, APRIL L., *Evaluating the Effectiveness of Air Force Foundational Cyberspace Training*. AFIT/ICW/ENG/12-05. Faculty Advisor: Maj Jonathan W. Butts. Sponsor: N/A.

## 6.2.4 FACULTY RESEARCH OUTPUT

Notes: Faculty Bios can be found under their respective department listings. Shared credit for funding awards is indicated by the percentages shown for each faculty member associated with the project.

### **ANDEL, TODD R., Maj, Department of Electrical and Computer Engineering**

#### REFEREED JOURNAL PUBLICATIONS

Jeffrey T. McDonald and Todd R. Anel, "Integrating Historical Security Jewels in Information Assurance Education," *IEEE Security and Privacy: Lost Treasures of Computer Security & Privacy*, Vol. 99, No. 1, June 2012, page 5555.

Todd R. Anel, Greg Back, and Alec Yasinsac, "Automating the Security Analysis Process of Secure Ad Hoc Routing," *Simulation Modeling Practice and Theory*, Vol. 19, No. 9, October 2011, pp. 2032-2049.

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

Brandon A. Brown, Todd R. Anel, and Yong Kim, "An FPGA Noise Resistant Digital Temperature Sensor with Auto Calibration," *In Proceedings of 6<sup>th</sup> International Conference on Information Systems, Technology, and Management (ICISTM 2012)*, Grenoble, France, 28-30 March 2012, pp. 325-335.

John Barron, Todd R. Anel, and Yong Kim, "Dynamic Architectural Countermeasure To Protect RSA Against Side Channel Power Analysis Attacks," *In Proceedings of 6<sup>th</sup> International Conference on Information Systems, Technology, and Management (ICISTM 2012)*, Grenoble, France, 28-30 March 2012, pp. 372-383.

Matthew F. Steele and Todd R. Anel, "Modeling the Optimized Link-State Routing Protocol for Verification," *Spring Simulation Multi-conference (SpringSim12)*, Orlando, FL, 26-29 March 2012, 8 pages.

### **BALDWIN, RUSTY O., Department of Electrical and Computer Engineering**

#### SPONSOR FUNDED RESEARCH PROJECTS

"Technical Support: Jiseki Development." Sponsor: NSA. Funding: \$300,000 – Baldwin 75%, Raines 25%.

"Wireless Communication Study: Project 7622." Sponsor: AFRL/RY. Funding: \$5,000.

"CRADA between AFIT and EWA Government Systems, Inc: DHS SBIR-2011.2 Phase I." Sponsor: AFRL/RI. Funding: \$30,000 – Baldwin 75%, Raines 25%.

"Joint Integrated Electronic Health Record (iEHR) Initial Operating Capability Support." Sponsor: TRICARE. Funding: \$1,790,500.

#### SPONSOR FUNDED EDUCATIONAL PROJECTS

"Federal Cyber Service: Scholarship for Service (SFS)." Sponsor: NSF. Funding: \$709,750.

#### REFEREED JOURNAL PUBLICATIONS

W. E. Cobb, R. O. Baldwin, and E. D. Laspe, "Leakage Mapping: A Systematic Methodology for Assessing the Side Channel Information Leakage of Cryptographic Implementations," Accepted for publication in *Transactions on Information and System Security*, September 2012.



G. Degirmenci, J. P. Kharoufeh, and R. O. Baldwin, "On the Performance Evaluation of Query-Based Wireless Sensor Networks," Accepted for publication in Performance Evaluation, August 2012.

D. P. Montminy, R. O. Baldwin, M. A. Temple, and E. D. Laspe, "Improving Cross-Device Attacks using Zero-Mean Unit-Variance Normalization," Accepted for publication in Journal of Cryptographic Engineering, August 2012.

W. E. Cobb, E. D. Laspe, R. O. Baldwin, M. A. Temple, and Y. C. Kim, "Intrinsic Physical Layer Authentication of Integrated Circuits," *Transactions on Information Forensics & Security*, Vol. 7, No. 1, pp. 14-24, February 2012.

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

R. O. Baldwin, M. Danis, "Virtualizing the Military's Information Applications," *Interconnected Health 2012*, Rosemont, IL, April 2012.

**DUBE, THOMAS E., Maj, Department of Electrical and Computer Engineering**

#### REFEREED JOURNAL PUBLICATIONS

Dube, T., R. Raines, G. Peterson, K. Bauer, M. Grimaila and S. Rogers, "Malware Target Recognition via Static Heuristics," *Computers and Security*, Vol. 31, Issue 1, February 2012, pp. 137-147.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

T. Dube, R. Raines, and S. Rogers, "Patent Application for Malware Target Recognition," Apr. 1, 2012.

**GRMAILA, MICHAEL R., Department of Systems and Engineering Management**

#### SPONSOR FUNDED RESEARCH PROJECTS

"Communication Channel Security." Sponsor: LTS. Funding: \$105,000 – Grimaila 50%, Humphries 50%.

"Support of the Robust Decision Making for Improved Mission Assurance STT." Sponsor: AFRL HQ. Funding: \$51,000.

**HODSON, DOUGLAS D., Department of Electrical and Computer Engineering**

#### REFEREED JOURNAL PUBLICATIONS

M.R. Grimaila, J. Morris, D. Hodson, "Quantum Key Distribution: A Revolutionary Security Technology," *The Information System Security Association (ISSA) Journal*, pp. 20-27, Jun 2012.

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

D.D. Hodson, R. Hill and A. Gutman, "Using LVC Simulations for Systems Analysis – Experimental and Software Design Issues," 80<sup>th</sup> Military Operations Research Society Symposium (MORS), Jun 2012.

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

D.D. Hodson, "Architecting Multi-Station Simulators," Spring Simulation Developer's Working Group (SDAWG sponsored by AFRL), Apr 2012.

D.D. Hodson, R. Hill and A. Gutman, "Using LVC Simulations for Systems Analysis – Experimental and Software Design Issues," Defense Analysis Seminar XVI – Analysis Support to Sustain and Enhance the ROK-US Alliance (DAS-XVI), Apr 2012.

**MCTASNEY, ROBERT J., LTC, Department of Electrical and Computer Engineering**

**OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES**

ACE (Advanced Cyber Education) Advisor for two undergraduate students a part of the Flash Memory Data Extraction Project for Summer 2012.

**MILLS, ROBERT F., Department of Electrical and Computer Engineering**

**SPONSOR FUNDED RESEARCH PROJECTS**

“Cognitive Electronic Warfare.” Sponsor: AFRL/RY. Funding: \$10,000.

**REFEREED JOURNAL PUBLICATIONS**

Grimaila, M.R., Myers, J., Mills, R.F., and Peterson, G., “Design and Analysis of a Dynamically Configured Log-based Distributed Security Event Detection Methodology,” *The Journal of Defense Modeling and Simulation: Applications, Methodology, Technology*, Sage Press, DOI: 10.1177/1548512911399303, Vol. 9(3), pp. 219-241, July 2012.

Bryant, A.R., Mills, R.F., Peterson, G.L., and Grimaila, M.R., “Software Reverse Engineering as a Sensemaking Task,” *Journal of Information Assurance and Security*, Vol. 6, Issue 6, pp. 483-494, 2011.

Birdwell, M.B., and Mills, R., “Warfighting in Cyberspace: Evolving Force Presentation and Command and Control,” *Air and Space Power Journal – Spanish Edition*, 4th Qtr, 2011.

Lacey, T.H., Mills, R.F., Mullins, B.E., Raines, R.A., Oxley, M.E., and Rogers, S.K., “RIPsec – Using Reputation-Based Multilayer Security to Protect MANETs,” *Computers & Security*, Vol. 31:1, Feb 2012, pp. 122-136, DOI:10.1016/j.cose.2011.09.005.

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

Evans, M., Grimaila, M.R., and Mills, R.F., “A Survey of Cyberspace Mission Assurance Within United States Air Force Communications Squadrons,” 2012 International Conference on Security and Management (SAM12), Las Vegas, Nevada, July 16-19, 2012.

Barcomb, K., Krill, J., Mills, R., and Saville, M. “Establishing Cyberspace Sovereignty,” International Conference on Information Warfare and Security (ICIW 2012), March 22-23, 2012, pp. 1-9.

Barcomb, K.E., Humphries, J.W., and Mills, R.F., “A Case for DOD Application of Public Cloud Computing Services,” 2011 Military Communications Conference (MILCOM 2011), Nov. 7-10, 2011, pp. 19-26.

**BOOKS AND CHAPTERS IN BOOKS**

Thomas, B., Mullins, B.E., Peterson, G.L., and Mills, R.F., “An FPGA System for Detecting Malicious DNS Network Traffic,” *Advances in Digital Forensics VII*, IFIP Advances in Information and Communication Technology, G.L. Peterson and S. Shenoi, Ed., Boston: Springer, 2011, pp. 195-207.

Haas, M.W., Mills, R.F., and Grimaila, M.R., “Aiding Understanding of Contested Information Environment Affect on Operations,” *Human-in-the-loop Simulation: Methods and Practice*, S. Narayanan, ed., London: Springer-Verlag, 2011, pp. 175-202.

**MULLINS, BARRY E., Department of Electrical and Computer Engineering**

**SPONSOR FUNDED RESEARCH PROJECTS**

“Development and Implementation of a Testbed for Research and Analysis of Malware.” Sponsor: DHS.  
Funding: \$220,000 – Mullins 40%, Humphries 20%, Butts 20%, Robinson 20%.

**SPONSOR FUNDED EDUCATIONAL PROJECTS**

“IASP Tuition and Resource Support for the AFIT Center for Cyberspace Research (CCR).” Sponsor:  
NIETP. Funding: \$128,921 – Mullins 50%, Raines 50%.

**REFEREED JOURNAL PUBLICATIONS**

D. J. Kelly, R. A. Raines, R. O. Baldwin, M. R. Grimaila and B. E. Mullins, “Exploring Extant and Emerging Issues in Anonymous Networks: A Taxonomy and Survey of Protocols and Metrics,” *IEEE Communications Surveys and Tutorials*, Vol. 14, No. 2, June 2012, pp. 579-606.

T. H. Lacey, R. F. Mills, B. E. Mullins, R. A. Raines, M. E. Oxley, and S. K. Rogers, “RIPsec – Using Reputation-Based Multilayer Security to Protect MANETs,” *Computers & Security*, Vol. 31, No. 1, February 2012, pp. 122-136.

D. T. Merritt and B. E. Mullins, “Identifying Cyber Espionage: Towards a Synthesis Approach,” *Journal of Network Forensics*, Vol. 3, No. 1, Autumn 2011, pp. 48-59.

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

B. E. Mullins, “Developing Cyber Warriors from Computer Engineers et al.,” 2012 American Society for Engineering Education Annual Conference, San Antonio, TX, June 2012, pp. 1-12.

**BOOKS AND CHAPTERS IN BOOKS**

B. D. Thomas, B. E. Mullins, G. L. Peterson and R. F. Mills, “An FPGA System for Detecting Malicious DNS Network Traffic,” *Advances in Digital Forensics VII*, G. Peterson and S. Sheno, eds., Springer Science+Business Media, New York, NY, 13 Oct 11, pp. 195-208.

**PETERSON, GILBERT L., Department of Electrical and Computer Engineering**

**REFEREED JOURNAL PUBLICATIONS**

Dube, T., Raines, R., Peterson, G.L., Bauer, K., Grimaila, M.R., and Rogers, S., “Malware Target Recognition via Static Heuristics,” *IEEE Computer & Security*, Vol. 31, No. 1, 2012, pp. 137-147. DOI: 10.1016/j.cose.2011.09.002.

Okolica, J., and Peterson, G.L., “Windows Driver Memory Analysis: A Reverse Engineering Methodology,” *IEEE Computers & Security*, Vol. 30, 2011, pp.770-779. DOI: 10.1016/j.cose.2011.08.001.

Okolica, J., and Peterson, G.L., “Extracting the Windows Clipboard from Physical Memory,” *Digital Investigation: The International Journal of Digital Forensics & Incident Response*, Vol. 8, sup. 1, 2011, pp. S118-S124. DOI: 10.1016/j.din.2011.05.014.

Bryant, A., Mills, R.F., Peterson, G.L., and Grimaila, M.R., “Software Reverse Engineering as a Sensemaking Task,” *International Journal of Information Assurance and Security*, Vol. 6, No. 6, 2011, pp. 483-494.

Weissgerber, K., Lamont, G.B., Borghetti, B.J., and Peterson, G.L., "Determining Solution Space Characteristics for Real Time Strategy Games & Characterizing Winning Strategies," *Computer Games Technology Journal*, Vol. 2011, 2011, pp. 1-17. DOI:10.1155/2011/834026.

Karrels, D.R., Peterson, G.L., and Mullins, B.E., "Large-scale Cooperative Task Distribution on Peer-to-Peer Networks," *Web Intelligence and Agent Systems* (Accepted: February 2012).

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

Hay, A., and Peterson, G.L., "Acquiring OS X File Handles through Forensic Memory Analysis," *IEEE Systematic Approaches to Digital Forensics*, Vancouver, BC, Canada, 2012.

Bryant, A.R., Mills, R.F., Peterson, G.L., and Grimaila, M.R., "Eliciting a sensemaking process from verbal protocols of reverse engineers," *Proceedings of the Annual Meeting of the Cognitive Science Society*, Sapporo Japan, Aug 1-4, 2012.

#### BOOKS AND CHAPTERS IN BOOKS

Peterson, G.L. and Shenoi, S., Eds. *Advances in Digital Forensics VIII*, New York, NY: Springer Science + Business Media, (in press) 2012.

Hay, A., Krill, D., Kuhar, B, and Peterson, G.L., "Evaluating Digital Forensics Options for the Apple iPad," *Advances in Digital Forensics VII*, G.L. Peterson and S. Shenoi, Ed., Boston: Springer, 2011, pp. 257-274.

Thomas, B.D., Mullins, B.E., Peterson, G.L., and Mills, R.F., "An FPGA System for Detecting Malicious DNS Network Traffic," *Advances in Digital Forensics VII*, G.L. Peterson and S. Shenoi, Ed., Boston: Springer, 2011, pp. 195-208.

#### **RAINES, RICHARD A., Department of Electrical and Computer Engineering**

##### REFEREED JOURNAL PUBLICATIONS

D. Kelly, R. Raines, R. Baldwin, B. Mullins, and M. Grimaila, "Exploring Extant and Emerging Issues in Anonymous Networks: A Taxonomy and Survey of Protocols and Metrics," *IEEE Communications Surveys and Tutorials*, Vol. 14, No. 2, 2012, pp. 579-606.

T. Dube, R. Raines, G. Peterson, K. Bauer, M. Grimaila and S. Rogers, "Malware Target Recognition via Static Heuristics," *Computers and Security*, Vol. 31, Issue 1, February 2012, pp. 137-147.

T. H. Lacey, R. F. Mills, B. E. Mullins, R. A. Raines, M. Oxley, and S. K. Rogers, "RIPsec – Using Reputation-Based Multilayer Security to Protect MANETs," *Computers and Security*, 31 (2012), pp. 122-136 DOI: 0.1016/j.cose.2011.09.005.

#### **TEMPLE, MICHAEL A., Department of Electrical and Computer Engineering**

##### SPONSOR FUNDED RESEARCH PROJECTS

"CR/SDR Based RFINT Technologies." Sponsor: LTS. Funding: \$46,721.

"RFINT for Commercial Communications." Sponsor: AS&T. Funding: \$50,426.

"Phase III Support: RF-EW Systems." Sponsor: AFRL/R.Y. Funding: \$85,000.

#### REFEREED JOURNAL PUBLICATIONS

Stone, Temple, "RF-Based Anomaly Detection for PLCs in Critical Infrastructure Apps," *Int'l Jour on Critical Infrastructure Protection*, Vol. 5, No. 2, pp. TBD, To Appear Jul 2012.

Cobb, Lapse, Baldwin, Temple, and Kim, "Intrinsic PHY-Layer Authentication of ICs," *IEEE Trans Info Forensics & Security, Special Issue: IC & Sys Security*, Vol. 7, No. 1, Feb 2012, pp. 14-24.

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

Kuciapinski, Temple, "(U) RFINT for Satellite Communications," *2012 Nat'l SIGINT Development Conf*, Baltimore MD, Classified Proceedings, Jun 2012, pp. CP.RF1.1- CP.RF1.9, 20% Presentation Sel Rate.

Reising, Temple, "WiMAX Mobile Subscriber Verification Using Gabor-Based RF-DNA Fingerprints," *2012 Int'l Communications Conference (ICC12)*, Ottawa, Canada, Jun12, pp. CISS:08-41- CISS:08-48, 31% Presentation Sel Rate.

Stone, Temple, "RF-Based Anomaly Detection for PLCs," *6th Annual Int'l Conf on Critical Infrastructure Protection*, IFIP Working Group 11.10, Fort McNair, Washington D.C., Mar 2012, pp. VII1-VI18.

Reising, Temple, and Oxley, "Gabor-Based RF-DNA Fingerprinting for Classifying 802.16e WiMAX Mobile Subscribers," *Int'l Conf on Computing, Networking and Communications (ICNC12)*, Jan 2012, pp. S21-S28, 35% Presentation Sel Rate.

Reising, Prentice, Temple, "An FPGA Implementation of Real-Time RF-DNA for RFINT Applications," *2011 Military Communications Conf (MILCOM11)*, Baltimore, MD, Nov 2011, pp. MILU.11.S3.1-MILU.11. S3.8.

### 6.3. CENTER FOR DIRECTED ENERGY

#### Center for Directed Energy (CDE)

Director 255-3636 x4506

Executive Administrator 255-3636 x4334

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

#### 6.3.1 DOCTORAL DISSERTATIONS

BROWN, KIRK C., *Collisional Dynamics, Lasing and Simulated Raman Scattering in Optically Pumped Cesium and Potassium Vapors*. AFIT/DS/ENP/12-M01. Faculty Advisor: Dr. Glen P. Perram. Sponsor: HELJTO.

LANGE, MATTHEW A., *Kinetics of the Electrical Discharge Pumped Oxygen-Iodine Laser*. AFIT/DS/ENP/11-S07. Faculty Advisor: Dr. Glen P. Perram. Sponsor: AFOSR.

#### 6.3.2 MASTER'S THESES

BENSON, MICHAEL R., *Characterization and Measurements from the Infrared Grazing Angle Reflectometer*. AFIT/OSE/ENP/12-J01. Faculty Advisor: Dr. Michael A. Marciniak. Sponsor: N/A.

BURCHETT, LEE R., *Turbulence Measurement in the Atmospheric Boundary Layer Using Cellular Telephone Signals*. AFIT/APPLPHY/ENP/12-M01. Faculty Advisor: Dr. Steven T. Fiorino. Sponsor: HELJTO.

BURLEY, JARRED L., *Comparison of High Energy Laser Expected Dwell Times and Probability of Kill for Mission Planning Scenarios in Actual and Standard Atmosphere*. AFIT/APPLPHY/ENP/12-M02. Faculty Advisor: Dr. Steven T. Fiorino. Sponsor: HELJTO.

FERREL, SIMON S., *Matrix Determination of Reflectivity of Hidden Objects via Indirect Photography*. AFIT/APPLPHY/ENP/12-M05. Faculty Advisor: Dr. Michael A. Marciniak. Sponsor: N/A.

LOTT, GORDON E., *Cesium Absorption Spectrum Perturbed by Argon: Observation of Non-Lorentzian Far Wings*. AFIT/APPLPHY/ENP/12-M08. Faculty Advisor: Dr. Glen P. Perram. Sponsor: HELJTO.

MCCONNELL, SHANE N., *Spectral and Spatial Coherent Emission of Thermal Radiation from Metal-Semiconductor Nanostructures*. AFIT/EE.ABET/ENP/12-M01. Faculty Advisor: Dr. Michael A. Marciniak. Sponsor: N/A.

ROTH, BENJAMIN D., *LADAR Performance Simulations with a High Spectral Resolution Atmospheric Transmittance and Radiance Model-LEEDR*. AFIT/APPLPHY/ENP/12-M09. Faculty Advisor: Dr. Steven T. Fiorino. Sponsor: AFRL/RV.

SCHAFER, JESSICA M., *The Focusing of Light Scattered from Diffuse Reflectors Using Phase Modulation*. AFIT/APPLPHY/ENP/12-M10. Faculty Advisor: Dr. Michael A. Marciniak. Sponsor: AFOSR.

SCHOFIELD, JOSEPH C., *Mapping Nuclear Fallout Using the Weather Research and Forecasting (WRF) Model*. AFIT/CWMD/ENP/12-S01. Faculty Advisor: Dr. Steven T. Fiorino. Sponsor: HELJTO.

SELLERS, SPENCER R., *FDTD Simulation of Novel Polarimetric and Directional Reflectance and Transmittance Measurements from Optical Nano- and Micro-Structured Materials*. AFIT/EE.ABET/ENP/12-M02. Faculty Advisor: Dr. Michael A. Marciniak. Sponsor: N/A.

### **6.3.3 FACULTY RESEARCH OUTPUT**

Notes: Faculty Bios can be found under their respective department listings. Shared credit for funding awards is indicated by the percentages shown for each faculty member associated with the project.

#### **BAILEY, WILLIAM F., Department of Engineering Physics**

##### SPONSOR FUNDED RESEARCH PROJECTS

“Thermochemical Modeling in Hypersonic Flow.” Sponsor: AFRL/RB. Funding: \$34,760.

#### **CUSUMANO, SALVATORE J., Department of Engineering Physics**

##### SPONSOR FUNDED RESEARCH PROJECTS

“Tactical High Energy Laser Weapon Alignment System Architecture Efficiencies.” Sponsor: HELJTO. Funding: \$174,239.

“Airborne Aero-Optic Laboratory.” Sponsor: AFRL/RD. Funding: \$114,650.

“Compensation of Aero-Optical and Atmospheric Disturbances via Coherence Phasing Loops of a Fiber Laser Array.” Sponsor: AFOSR. Funding: \$75,000 – Cusumano 51%, Fiorino 49%.

“Wave Optics Modeling and Simulation for NPS and Laser Target Interaction Study.” Sponsor: NPS. Funding: \$62,500 – Cusumano 40%, Hyde 30%, Marciniak 15%, Fiorino 15%.

##### SPONSOR FUNDED EDUCATIONAL PROJECTS

“High Energy Laser Weapons Systems Short Course Continued Development and Delivery.” Sponsor: AFRL/RD. Funding: \$19,380 – Cusumano 55%, Fiorino 45%.

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

Burley, J.L., S.T. Fiorino, R.M. Randall, R.J. Bartell, and S.J. Cusumano, “High energy laser tactical decision aid (HELTDA) for mission planning and predictive avoidance,” (Proc. of SPIE Vol. 8381 83811L-14) SPIE Defense, Security and Sensing Symposium, Baltimore, MD, 23-26 April 2012.

Basu, S., S.J. Cusumano, M.W. Hyde, M.A. Marciniak, and S.T. Fiorino, “Validity of using Gaussian Schell model for extended beacon studies,” (Proc. of SPIE Vol. 8380 83800E-1) SPIE Defense, Security and Sensing Symposium, Baltimore, MD, 23-26 April 2012.

#### **FIORINO, STEVEN T., Department of Engineering Physics**

##### SPONSOR FUNDED RESEARCH PROJECTS

“CY2012 HELJTO M&S TAWG Product Development.” Sponsor: HELJTO. Funding: \$625,000 – Fiorino 51%, Cusumano 47%, Gross 1%, Hawks 1%.

“Modification of AFIT Atmospheric Effects Software Code for AFRL/RD.” Sponsor: AFRL/RD. Funding: \$108,136 – Fiorino 45%, Cusumano 45%, Randall 10%.

“High Energy Laser-Joint Technology Office Contracting Officer Technical Representative.” Sponsor: HELJTO. Funding: \$6,864.

“2012 AFIT Center for Directed Energy Summer Intern (DESI) Program.” Sponsor: HELJTO. Funding: \$50,000 – Fiorino 55%, Cusumano 45%.

“Airborne Aero-Optics Lab Beam Control Collection and Evaluation.” Sponsor: HELJTO. Funding: \$51,280 – Fiorino 45%, Cusumano 55%.

#### REFEREED JOURNAL PUBLICATIONS

Fiorino, S.T., J.A. Deibel, P.M. Grice, M.H. Novak, J. Spinoza, L. Owens, S. Ganti, “A Technique to Measure Optical Properties of Brownout Clouds for Modeling Terahertz Propagation,” *Applied Optics*, Vol. 51, Iss. 16, pp. 3605–3613 (2012).

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

Fiorino, S.T., S.M. Shirey, M.F. Via, D.J. Grahm, and M.J. Krizo, “Potential Impacts of Elevated Aerosol Layers on High Energy Laser Aerial Defense Engagements,” (Proc. of SPIE Vol. 8380 83800T-1) SPIE Defense, Security and Sensing Symposium, Baltimore, MD, 23-26 April 2012.

Beauchamp, R.L. and S.T. Fiorino, “Propagation of laser light through aero-optic flow: dry air at 0.4 Mach with three-dimensional turret,” (Proc. of SPIE Vol. 8380 83800M-1) SPIE Defense, Security and Sensing Symposium, Baltimore, MD, 23-26 April 2012.

Roth, B.D. and S.T. Fiorino, “LADAR Performance Simulations with a High Spectral Resolution Atmospheric Transmittance and Radiance Model - LEEDR,” (Proc. of SPIE Vol. 8379 83790O-15) SPIE Defense, Security and Sensing Symposium, Baltimore, MD, 23-26 April 2012.

Burley, J.L., S.T. Fiorino, R.M. Randall, R.J. Bartell, and S.J. Cusumano, “High energy laser tactical decision aid (HELTDA) for mission planning and predictive avoidance,” (Proc. of SPIE Vol. 8381 83811L-14) SPIE Defense, Security and Sensing Symposium, Baltimore, MD, 23-26 April 2012.

Burchett, L.R., S.T. Fiorino, and M. Buchanan, “Automation of  $C_n^2$  Profile Extraction from Weather Radar Images,” (Proc. of SPIE Vol. 8380 83800I-1) SPIE Defense, Security and Sensing Symposium, Baltimore, MD, 23-26 April 2012.

Basu, S., S.J. Cusumano, M.W. Hyde, M.A. Marciniak, and S.T. Fiorino, “Validity of using Gaussian Schell model for extended beacon studies,” (Proc. of SPIE Vol. 8380 83800E-1) SPIE Defense, Security and Sensing Symposium, Baltimore, MD, 23-26 April 2012.

#### **GROSS, KEVIN C., Department of Engineering Physics**

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

Roberto I. Acosta, Kevin C. Gross, Glen P. Perram, “Mid-Infrared Imaging Fourier Transform Spectrometry for High Power Fiber Laser Irradiated Fiberglass Composites,” Proc. of the SPIE 8239, 8239R (2012); <http://dx.doi.org/10.1117/12.906434>. SPIE Photonics West, San Francisco, CA, 21–26 January 2012. (Invited paper.)

#### **HYDE, MILO W., Maj, Department of Electrical and Computer Engineering**

#### SPONSOR FUNDED RESEARCH PROJECTS

“Phase Unwrapping Experiments in Strong Turbulence.” Sponsor: AFOSR. Funding: \$68,000. [CDE]

#### **MARCINIAK, MICHAEL A., Department of Engineering Physics**

#### SPONSOR FUNDED RESEARCH PROJECTS

“Dynamic Data-Driven BRDF Measurement System.” Sponsor: AFRL/RV. Funding: \$170,000.



“Indirect Photography.” Sponsor: AFOSR. Funding: \$49,155.

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

A.N. Volkov, L.V. Zhigilei, Michael A. Marciniak and Glen P. Perram, “Computational study of the role of oxidation in CW laser ablation of an aluminum target in a shear gas flow,” Proceedings of the 11<sup>th</sup> International Conference on Laser Ablation, (2011).

Jason C. Vap, Stephen E. Nauyoks and Michael A. Marciniak, “Optimization of a mid-wave tunable polarimetric optical scatter instrument,” Proceedings of the SPIE **8364**, 8364-5 (2012).

Jason C. Vap and Michael A. Marciniak, “Examining epsilon near zero structures through effective medium theory and optical thin-film analysis,” Proceedings of the SPIE **8364**, 8364-26 (2012).

Santasri Basu, Salvatore J. Cusumano, Milo W. Hyde, Michael A. Marciniak, and Steven T. Fiorino, “Validity of using Gaussian Schell model for extended beacon studies,” Proceedings of the SPIE **8380**, 8380-13 (2012).

Shane N. McConnell, Michael D. Seal, Stephen E. Nauyoks, Neil R. Murphy, Lirong Sun and Michael A. Marciniak, “Spectral coherent emission of thermal radiation in the far-field from a truncated resonator,” Proceedings of the SPIE **8457**, 8457-115 (2012).

Spencer R. Sellers, Jason C. Vap, Stephen E. Nauyoks, Michael A. Marciniak and Zahun Ku, “Investigation of surface plasmonic extraordinary transmission for spectral, polarimetric, and off-normal incidence,” Proceedings of the SPIE **8457**, 8457-130 (2012).

Jessica M. Schafer and M.A. Marciniak, “The focusing of light scattered from diffuse reflectors using phase modulation,” Proceedings of the SPIE **8495**, 8495-24 (2012).

Simon S. Ferrel and M.A. Marciniak, “Matrix determination of hidden object reflectance by indirect photography,” Proceedings of the SPIE **8495**, 8495-27 (2012).

Michael R. Benson, Michael A. Marciniak and Jeffrey W. Burks, “Measuring grazing-angle DHR with the Infrared Grazing Angle Reflectometer,” Proceedings of the SPIE **8495**, 8495-28 (2012).

Stephen E. Nauyoks and Michael A. Marciniak, “Effects of a measurement floor on Mueller matrix measurements in a DRR BSDF system,” Proceedings of the SPIE **8495**, 8495-32 (2012).

#### **PERRAM, GLEN P., Department of Engineering Physics**

#### SPONSOR FUNDED RESEARCH PROJECTS

“Validated Atmospheric Propagation for Diode Pumped Alkali Lasers.” Sponsor: HELJTO. Funding: \$90,000.

“Merging Hyperspectral Imagery and Multi-Scale Modeling for Laser Lethality.” Sponsor: AFOSR. Funding: \$435,354 – Perram 80%, Marciniak 20%.

“High Power Diode Pumped Alkali Vapor Lasers and Analog Systems.” Sponsor: HELJTO. Funding: \$293,564 – Perram 60%, Marciniak 20%, Gross 20%.

“Diode Pumped Rare Gas Lasers.” Sponsor: HELJTO. Funding: \$124,602.

#### REFEREED JOURNAL PUBLICATIONS

Monte D. Anderson and Glen P. Perram, “Optical delay with spectral hole burning in Doppler-broadened cesium vapor,” 285, 3264-3268, *Optics Communications* (July 2012).

Kirk C. Brown and Glen P. Perram, “Spin-orbit relaxation and quenching of cesium 7 2P in mixtures of helium, methane, and ethane,” *Physical Review A* 85, Article No. 022713 (Feb 2012).

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

Glen P. Perram, “Alternative Wavelengths for Optically Pumped Alkali Lasers,” SPIE Defense and Security Symposium, SPIE Proc 8381-8, April 2012, Baltimore, MD.

Charleton D. Lewis, David E. Weeks, and Glen P. Perram, “Diode Pumped Alkali Laser Kinetics: Comparison and Theory and Experiment,” SPIE Defense and Security Symposium, Proc. of SPIE Vol. 8381 (2012) 83810A.

Christopher A. Rice and Glen P. Perram, “Atmospheric Transmission for Cesium DPAL using TDLAS,” SPIE Photonics West, SPIE Proc 82380I, January 2012, San Francisco, CA.

Charles D. Fox and Glen P. Perram, “Investigation of Radial Temperature Gradients in Diode Pumped Alkali Lasers Using Tunable Diode Laser Absorption Spectroscopy,” SPIE Photonics West, SPIE Proc 828306, January 2012, San Francisco, CA.

Roberto Acosta, Kevin C. Gross, Michael A. Marciniak, and Glen P. Perram, “Mid Infrared Imaging Fourier Transform Spectrometry for high power fiber and CO<sub>2</sub> laser irradiated plexiglass, fiberglass and painted metals,” SPIE Photonics West, SPIE Proc 82390R, January 2012, San Francisco, CA.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Session Chair, “Gas Lasers” in SPIE Security and Defence, 24-27 Sept, Edinburgh, Scotland, Sept 2012.

Invited Talk - Glen P. Perram, “*Diode Pumped Alkali Laser Bleached Wave Dynamics*” SPIE Defence and Security, 24-27 Sept 2012, Edinburgh, Scotland.

Invited Talk - Roberto Acosta, Kevin C. Gross, Michael A. Marciniak, and Glen P. Perram, “Mid Infrared Imaging Fourier Transform Spectrometry for high power fiber and CO<sub>2</sub> laser irradiated plexiglass, fiberglass and painted metals” SPIE Photonics West, January 2012, San Francisco, CA.

SPIE Newsroom Article – Glen P. Perram, “High Power Diode Pumped Alkali Lasers” 18 January 2012, SPIE Newsroom. DOI: 10.1117/2.1201201.004013.

## **6.4. CENTER FOR TECHNICAL INTELLIGENCE STUDIES AND RESEARCH**

### **Center for Technical Intelligence Studies and Research (CTISR)**

Director 255-3636 x4547

Executive Program Coordinator 255-7287

FAX 656-6000

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

### **6.4.1 DOCTORAL DISSERTATIONS**

STEWART, BRYAN J., *Characterization and Discrimination of Large Caliber Gun Blast and Flash Signatures*. AFIT/DS/ENP/11-D01. Faculty Advisor: Dr. Glen P. Perram. Sponsor: NASIC.

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

EKHOLM, JARED M., *3-D Scene Reconstruction from Aerial Imagery*. AFIT/APPLPHY/ENP/12-M03. Faculty Advisor: Lt Col Karl C. Walli. Sponsor: AFRL/RV.

SU'E, CHAD B., *Characterization of a Hyperspectral Chromotomographic Imaging Ground System*. AFIT/EE.ABET/ENP/12-M03. Faculty Advisor: Lt Col Michael R. Hawks. Sponsor: N/A.

### **6.4.3 FACULTY RESEARCH OUTPUT**

Notes: Faculty Bios can be found under their respective department listings. Shared credit for funding awards is indicated by the percentages shown for each faculty member associated with the project.

#### **BOREL-DONOHUE, CHRISTOPH C., Department of Engineering Physics**

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

Christoph Borel, Dalton Rosario, Joao Romano, "Range-invariant anomaly detection applied to imaging Fourier Transform Spectrometry data," Proceedings of the 2012 Optical Engineering+Applications SPIE Optics+Photonics, 14-16 August 2012, San Diego, CA. Conference: Imaging Spectrometry XVII (Shen/Lewis), Vol. 8515, paper 85150J-1.

Christoph C. Borel, David J. Bunker, "Multispectral Vegetative Canopy Parameter Retrieval," Proceedings of the SPIE Vol. 8174, 4 Oct 2011, Remote Sensing for Agriculture, Ecosystems, and Hydrology XIII Conference (Neale/Maltese), paper 81740T-1.

#### **BUNKER, DAVID J., Department of Engineering Physics**

##### SPONSOR FUNDED RESEARCH PROJECTS

"Rapid Location of Radiation Sources in Complex Environments Using Optical and Radiation Sensors." Sponsor: DTRA. Funding: \$381,998 – Bunker 25%, Borel-Donohue 50%, Magnus 15%, Tuttle 10%.

"Intelligence, Surveillance and Reconnaissance Research Program." Sponsor: SAIC. Funding: \$20,000 – Bunker 10%, Borel-Donohue 90%.

"Overhead Persistent Infra-Red R&D." Sponsor: NGA. Funding: \$454,000 – Bunker 50%, Borel-Donohue 40%, Tuttle 5%, Walli 5%.

"Gait Signature Research." Sponsor: NRL. Funding: \$115,000 – Bunker 35%, Borel-Donohue 40%, Tuttle 20%, Walli 5%.

“Trajectory Prediction Code Assessment.” Sponsor: NASIC. Funding: \$14,840 – Bunker 80%, Tuttle 20%.

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

Christoph C. Borel, David J. Bunker, “Multispectral Vegetative Canopy Parameter Retrieval,” Proceedings of the SPIE Vol. 8174, 4 Oct 2011, Remote Sensing for Agriculture, Ecosystems, and Hydrology XIII Conference (Neale/Maltese), paper 81740T-1.

**GROSS, KEVIN C., Department of Engineering Physics**

#### SPONSOR FUNDED RESEARCH PROJECTS

“NASIC Ground Truth Support.” Sponsor: NASIC. Funding: \$149,985.

#### REFEREED JOURNAL PUBLICATIONS

Bryan J. Steward, Glen P. Perram, Kevin C. Gross, “Modeling Midwave Infrared Muzzle Flash Spectra from Unsuppressed and Flash-Suppressed Large Caliber Munitions,” *Infrared Physics & Technology*, Vol. 55, No. 4, pp. 246–255 (2012). <http://dx.doi.org/10.1016/j.infrared.2012.04.005> ( July 2012).

Bryan J. Steward, Glen P. Perram, Kevin C. Gross, “Visible and Near-Infrared Spectra of the Secondary Combustion of a 152 mm Howitzer,” *Applied Spectroscopy*, Vol. 65, No. 12, pp. 1363–1371 (2011). <http://dx.doi.org/10.1366/11-06445>. (Dec 2011).

Bryan J. Steward, Kevin C. Gross, Glen P. Perram, “Optical Characterization of Large Caliber Muzzle Blast Waves,” *Propellants, Explosives, and Pyrotechnics*, Vol. 36, No. 6, pp. 564–575 (2011). <http://dx.doi.org/10.1002/prop.201100037> (Dec 2011).

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

Jacob L. Harley, Charles F. Wisniewski, August J. Rolling, and Kevin C. Gross, “Spatially-Resolved Infrared Spectra of Jet Exhaust from an F109 Turbofan Engine,” Proc. of the SPIE, Vol. 8354, pp. 83540H (2012). <http://link.aip.org/link/doi/10.1117/12.920630>. SPIE Defense, Security, and Sensing, Baltimore, MD, 23–27 April 2012.

Bryan J. Steward, Kevin C. Gross, and Glen P. Perram, “Characterization and discrimination of large caliber gun blast and flash signatures,” Proc. of the SPIE, Vol. 8360, pp. 836006 (2012). <http://dx.doi.org/10.1117/12.920583>. SPIE Defense, Security, and Sensing, Baltimore, MD, 23–27 April 2012.

**HAWKS, MICHAEL R., Lt Col, Department of Engineering Physics**

#### SPONSOR FUNDED RESEARCH PROJECTS

“Sensor Development for Monocular Passive Ranging (MOPAR).” Sponsor: NASIC. Funding: \$180,000.

**PERRAM, GLEN P., Department of Engineering Physics**

#### REFEREED JOURNAL PUBLICATIONS

Randall L. Bostick and Glen P. Perram “Instrumental error in chromotomosynthetic hyperspectral imaging,” *Applied Optics*, Vol. 51, pp. 5186-5200 (July 2012).

Bryan J. Steward, Kevin C. Gross, and Glen P. Perram, "Modeling Midwave Infrared Muzzle Flash Spectra from Unsuppressed and Flash-Suppressed Large Caliber Munitions," *Infrared Physics and Technology*, Vol. 55, pp. 246–255( July 2012).

Randall Bostick and Glen P. Perram, "Spatial and spectral performance of a chromotomosynthetic hyperspectral imaging system," *Review of Scientific Instruments*, Vol. 83, Article No. 033110, Mar 2012.

Bryan J. Steward, Glen P. Perram, and Kevin C. Gross, "Visible and Near-Infrared Spectra of the Secondary Combustion of a 152 mm Howitzer," *Applied Spectroscopy* 65, pp. 1363-1371 (December 2011).

Bryan J. Steward, Kevin C. Gross, Glen P. Perram, "Optical characterization of large caliber muzzle blast waves," *Propellant, Explosives and Pyrotechnics*, Vol. 36, pp. 564-575 (December 2011).

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

Bryan J. Steward, Kevin C. Gross, and Glen P. Perram, "Characterization and Discrimination of Large Caliber Gun Blast and Flash Signatures," SPIE Defense and Security Symposium, SPIE Proc 8360-5, April 2012, Baltimore, MD.

**WALLI, KARL C., Lt Col, Department of Engineering Physics**

#### SPONSOR FUNDED RESEARCH PROJECTS

"Physics Based NUDET Modeling." Sponsor: NNSA. Funding: \$25,000 – Walli 75%, Bunker 25%.

## 6.5. CENTER FOR OPERATIONAL ANALYSIS

### Center for Operational Analysis (COA)

Director 255-6565 x4708

Projects Director 255-6565 x4251

Homepage: <http://www.afit.edu/coa/>

### 6.5.1 DOCTORAL DISSERTATIONS

DILLENBURGER, STEVEN P., *Minimization of Collateral Damage in Airdrops and Airstrikes*. AFIT/DS/ENS/12-01. Faculty Advisor: Dr. Jeffery K. Cochran. Sponsor: AFRL/RB.

HARPER, TIFFANY J., *Agent Based Modeling and Simulation Framework for Supply Chain Risk Management*. AFIT/DS/ENS/12-02. Faculty Advisor: Dr. John O. Miller. Sponsor: AFGLSC.

HARTLAGE, ROBERT B., *Rough-Cut Capacity Planning in Multimodal Freight Transportation Networks*. AFIT/DS/ENS/12-03. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: USTRANSCOM.

JORDAN, JEREMY D., *The Average Network Flow Problem: Shortest Path and Minimum Cost Flow Formulations, Algorithms, Heuristics and Complexity*. AFIT/DS/ENS/12-09. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: USTRANSCOM.

MINDRUP, FRANCIS M., *Optimizing Hyperspectral Imagery Anomaly Detection Algorithms through Improved Robust Parameter Design Techniques*. AFIT/DS/ENS/11-04. Faculty Advisor: Dr. Kenneth W. Bauer. Sponsor: NASIC.

WILLIAMS, JASON P., *Towards the Mitigation of Correlation Effects in the Analysis of Hyperspectral Imagery with Extensions to Robust Parameter Design*. AFIT/DS/ENS/12-07. Faculty Advisor: Dr. Kenneth W. Bauer. Sponsor: N/A.

### 6.5.2 MASTER'S THESES

BEARD, WILLIAM P., *Personnel, the Class 0 Supply Item: A Logistics Management Approach to Supplying Combatant Commanders with Warfighters*. AFIT/LSCM/ENS/12-01. Faculty Advisor: Lt Col Sharon G. Heilmann. Sponsor: N/A.

BENGOZ, AHMET, *Using VFT as a Constraint for Goal Programming Models: A Case Study for Turkish Air Force Flying Hour Program*. AFIT/OR-MS/ENS/12-01. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: TuAF.

BENGOZ, EMEL, *Value Focused Thinking in Developing Aerobatic Aircraft Selection Model for Turkish Air Force*. AFIT/OR-MS/ENS/12-02. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: TuAF.

BLAKE, JASON A., *Modeling and Analysis of AF Depot Business Practices for Supply*. AFIT/OR-MS/ENS/12-03. Faculty Advisor: Dr. John O. Miller. Sponsor: AFMC/402 SCMS.

BREITBACH, TIMOTHY W., *Afghanistan Air Cargo Routing: An Inter/Intra-Theater Approach*. AFIT/LSCM/ENS/12-02. Faculty Advisor: Dr. Alan W. Johnson. Sponsor: AMC/A9.

BUSH, KELLY R., *Using QR Factorization for Real-Time Anomaly Detection of Hyperspectral Images*. AFIT/OR-MS/ENS/12-04. Faculty Advisor: Dr. Kenneth W. Bauer. Sponsor: NASIC.

BUTLER, HARRIS K., *The Relationship Between Diversity and Accuracy in Multiple Classifier Systems*. AFIT/OR-MS/ENS/12-05. Faculty Advisor: Lt Col Mark A. Friend. Sponsor: N/A.

CHAMBERLAIN, CHAD N., *Analysis of KC-46 Live-Fire Risk Mitigation Program Testing*. AFIT/OR-MS/ENS/12-06. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: OSD.

DENNEY, DUANE M., *High Velocity Maintenance Implementation Strategies on Low Observable Aircraft*. AFIT/LSCM/ENS/12-03. Faculty Advisor: Maj Daniel D. Mattioda. Sponsor: ASC.

DISMUKES, TAMILYN S., *Surveillance Versus Reconnaissance: An Entropy Based Model*. AFIT/OR-MS/ENS/12-09. Faculty Advisor: Dr. Darryl K. Ahner. Sponsor: N/A.

FINDLEY, JONATHAN S., *A Decision Analysis Perspective on Multiple Response Robust Optimization*. AFIT/OR-MS/ENS/12-10. Faculty Advisor: Maj Matthew J. Robbins. Sponsor: AFRL/RI.

FISHER, RYAN S., *A Simulation to Evaluate Joint Military Logistics in a Humanitarian Assistance Environment*. AFIT/LSCM/ENS/12-04. Faculty Advisor: Dr. William A. Cunningham. Sponsor: USTRANSCOM.

FRIESEN, KELLY D., *Automatic Target Recognition for Hyperspectral Imagery*. AFIT/OR-MS/ENS/12-11. Faculty Advisor: Dr. Kenneth W. Bauer. Sponsor: NASIC.

GLASSBURNER, AARON V., *Evaluation of Inventory Reduction Strategies: Balad Air Base Simulation Case Study*. AFIT/LSCM/ENS/12-05. Faculty Advisor: Dr. Kenneth W. Bauer. Sponsor: AFLMA.

HAINES, CHRISTOPHER B., *A Model for Reducing Uncertainty in ISR Collection Operations*. AFIT/OR-MS/ENS/12-13. Faculty Advisor: Dr. Darryl K. Ahner. Sponsor: N/A.

HUNTER, TERI M., *An Analysis of the Impact of Job Search Behaviors on Air Force Company Grade Officer Turnover*. AFIT/LSCM/ENS/12-06. Faculty Advisor: Lt Col Sharon G. Heilmann. Sponsor: N/A.

JESSUP, MEREDITH A., II, *Using Hybrid Simulation/Analytical Queuing Networks to Capacitate USAF Air Mobility Command Passenger Terminals*. AFIT/OR-MS/ENS/12-14. Faculty Advisor: Dr. Jeffrey K. Cochran. Sponsor: USPACOM.

KALLONIATIS, CHRISTOFOROS, *Exploring the Dynamics and Modeling National Budget as a Supply Chain System: A Proposal for Reengineering the Budgeting Process and for Developing a Management Flight Simulator*. AFIT/LSCM/ENS/12-07. Faculty Advisor: Dr. William A. Cunningham. Sponsor: N/A.

KIM, JAEBUM, *Decision Analysis Using Value-Focused Thinking for Retention of Long-Term Officers in the Korean Army*. AFIT/OR-MS/ENS/12-15. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: ROKAF.

KINKLE, MARISHA T., *A Multi-Stage Optimization Model for Air Force Reserve Officer Training Corps Officer Candidate Selection*. AFIT/OR-MS/ENS/12-16. Faculty Advisor: Maj Matthew J. Robbins. Sponsor: AFROTC.

KOSLOW, MICHAEL J., *Ballistic Flash Characterization: Penetration and Back-Face Flash*. AFIT/OR-MS/ENS/12-17. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: AFMC/46 TG.

LARIMORE, JASON A., *Tanker Fuel Consolidation: Effects of Higher Fidelity Modeling on a Resilient Plan*. AFIT/LSCM/ENS/12-08. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: AMC/A9.

LEITER, MEGAN A., *Simulation Modeling and Analysis of the Impact of Individual Mobility Augmentee Loss at the Tanker Airlift Control Center*. AFIT/OR-MS/ENS/12-18. Faculty Advisor: Dr. John O. Miller. Sponsor: AMC/618 TACC.

LOW, MICHAEL S., *Impact of Decision Criteria on Federal Aviation Administration Certification of Military Commercial Derivative Aircraft*. AFIT/LSCM/ENS/12-10. Faculty Advisor: Dr. Alan W. Johnson. Sponsor: AFMC/A4.

MCWILLIAMS, MARCUS R., *Improving Knowledge of C-130 Aircraft Condition: A High Velocity Maintenance Case Study*. AFIT/LSCM/ENS/12-11. Faculty Advisor: Dr. Alan W. Johnson. Sponsor: AFMC/A4.

MILLER, ALLEN R., *Minuteman III Cost Per Alert Hour Analysis*. AFIT/LSCM/ENS/12-12. Faculty Advisor: Dr. William A. Cunningham. Sponsor: AFNWC.

MILLER, KARI A., *Diminishing Manufacturing Sources and Material Shortages Mitigation Strategies: A Multiple-Case Study*. AFIT/LSCM/ENS/12-13. Faculty Advisor: Maj Daniel D. Mattioda. Sponsor: ASC.

NUNNALLY, BEAU A., *Using Multiattribute Utility Copulas in Support of UAV Search and Destroy Operations*. AFIT/OR-MS/ENS/12-20. Faculty Advisor: Maj Matthew J. Robbins. Sponsor: N/A.

PERRY, JOHN F., II, *The Impact of Supply Chain Business Processes on Competitive Advantage and Organizational Performance*. AFIT/LSCM/ENS/12-14. Faculty Advisor: Dr. William A. Cunningham. Sponsor: AFRL/RX.

PEYTON, DAVID J., *Ballistic Flash Characterization of Entry-Side Flash*. AFIT/OR-MS/ENS/12-21. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: AFMC/46 TG.

RUBINO, DEREK P., *A Multiple-Case Study on Department of Defense Insourcing Projects*. AFIT/GLM/ENS/12-15. Faculty Advisor: Dr. Jeffrey A. Ogden. Sponsor: ASC.

SAIE, CADE M., *Understanding the Instruments of National Power Through a System of Differential Equations in a Counterinsurgency*. AFIT/GSE/ENS/12-01. Faculty Advisor: Dr. Darryl K. Ahner. Sponsor: CAA.

SALAZAR, RONALD M., *The Effect of Supply Chain Management Processes on Competitive Advantage and Organizational Performance*. AFIT/LSCM/ENS/12-16. Faculty Advisor: Dr. William A. Cunningham. Sponsor: AFRL/RX.

SAYLAM, SERHAT, *A Spreadsheet Model that Estimates the Impact of Reduced Distribution Time on Inventory Investment Savings: What is a Day Taken Out of the Pipeline Worth in Inventory?* AFIT/LSCM/ENS/12-17. Faculty Advisor: Dr. William A. Cunningham. Sponsor: TuAF & USTRANSCOM.

SENAY, NURDINC, *The Strategic Level Optimization of Air to Ground Missiles for Turkish Air Force Decision Support System*. AFIT/OR-MS/ENS/12-23. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: TuAF.

SITU, JOHN X., *Combat Identification of Synthetic Aperture Radar Images Using Contextual Features and Bayesian Belief Networks*. AFIT/OR-MS/ENS/12-24. Faculty Advisor: Lt Col Mark A. Friend. Sponsor: N/A.

SMYTH, KEVIN B., *W78 Weapon System Supply Web: Discrete Event Simulation Modeling for Life Extension Program Planning*. AFIT/LSCM/ENS/12-18. Faculty Advisor: Dr. Alan W. Johnson. Sponsor: AFMC/498 NSW.

STAHL, GUILLERMO A., *An Evaluation of the Argentinean Basic Trainer Aircraft Domestic Development Project*. AFIT/LSCM/ENS/12-19. Faculty Advisor: Maj Daniel D. Mattioda. Sponsor: Argentine Air Force.



STORM, SCOTT M., *Evaluating Aerial Refueling Simulator Validation Test Designs by Extending Response Surface Methodology to Analyze Time History Responses*. AFIT/OR-MS/ENS/12-25. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: OSD.

TAN, HUANG TENG, *The In-Transit Vigilant Covering Tour Problem for Routing Unmanned Ground Vehicles*. AFIT/OR-MS/ENS/12-31. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: N/A.

TOPALOGU, IHSAN, *Initial Spare Parts of the A400M Aircraft*. AFIT/LSCM/ENS/12-20. Faculty Advisor: Maj Daniel D. Mattioda. Sponsor: N/A.

UZ, VEYSEL, *CNG as a Feasible Replacement for the U.S. Transportation Sector*. AFIT/LSCM/ENS/12-21. Faculty Advisor: Lt Col Bradley E. Anderson. Sponsor: Chesapeake Energy.

WEIBLEN, JARRETT L., *The Effects of Deployments and Other Factors on Air Force Junior Officer Retention*. AFIT/LSCM/ENS/12-22. Faculty Advisor: Dr. Darryl K. Ahner. Sponsor: OSD.

WEIMER, CHRISTOPHER W., *Forecasting Effects of Influence Operations: A Generative Social Science Methodology*. AFIT/OR-MS/ENS/12-26. Faculty Advisor: Dr. John O. Miller. Sponsor: 711 HPW/RH.

WEITZ, MICHAEL T., *C-5M Super Galaxy Utilization with Joint Precision Airdrop System*. AFIT/LSCM/ENS/12-23. Faculty Advisor: Dr. Alan W. Johnson. Sponsor: AMC/A4.

WHITE, ANTHONELLI, *The Relationship Between Key Supply Chain Process Implementation, Competitive Advantage and Organizational Performance*. AFIT/LSCM/ENS/12-24. Faculty Advisor: Dr. William A. Cunningham. Sponsor: AFRL/RX.

WILLIAMS, DAVID R., *Examining EXPRESS with Simulation*. AFIT/OR-MS/ENS/12-27. Faculty Advisor: Dr. John O. Miller. Sponsor: AFGLSC.

WILLIAMS, KRISTY N., *A Benchmarking Study of Air Force Program Manager Competencies*. AFIT/OR-MS/ENS/12-28. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: AFMC/A9.

WOLF, SEAN E., *Modeling Small Unmanned Aerial System Mishaps Using Logistic Regression and Artificial Neural Networks*. AFIT/OR-MS/ENS/12-29. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: AFRL/RW.

WOODDELL, DAVID R., *Probabilistic Model for Laser Damage to the Human Retina*. AFIT/OR-MS/ENS/12-30. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: 711 HPW/RH.

YUKSELEN, KORHAN G., *An Assessment Tool of Performance Based Logistics Appropriateness*. AFIT/LSCM/ENS/12-25. Faculty Advisor: Dr. Jeffrey A. Ogden. Sponsor: TuAF.

### **6.5.3 GRADUATE RESEARCH PAPERS**

ANDERSON, SHANON E., *Employing the Management Internal Control Toolset (MICT) Across the Enterprise*. AFIT/IMO/ENS/12-02. Faculty Advisor: Dr. Jeffrey A. Ogden. Sponsor: SAF.

BAILEY, CRAIG S., *Critical Elements and Needs for Nuclear Weapons Maintenance: A Delphi Study*. AFIT/ILS/ENS/12-01. Faculty Advisor: Dr. Alan W. Johnson. Sponsor: AFMC/A10.

BRINE, ERIK G., *Prioritizing Foreign Military Engagements: A Multi Objective Decision Analysis Using Value Focused Thinking*. AFIT/IMO/ENS/12-03. Faculty Advisor: Dr. Stephen P. Chambal. Sponsor: SAF.

CARMICHAEL, CHRISTOPHER L., *An Empirical Investigation of the Effectiveness of the Logistics Readiness Squadron Concept*. AFIT/IMO/ENS/12-04. Faculty Advisor: Lt Col Doral E. Sandlin. Sponsor: HQ USAF/A4.

CARTER, CHARLES L., *Intelligence Support to Supply Chain Risk Management*. AFIT/ILS/ENS/12-02. Faculty Advisor: Maj Daniel D. Mattioda. Sponsor: AFMC/IS.

DEYOUNG, DANIEL S., *Time Series Forecasting of Airlift Sustainment Cargo Demand*. AFIT/IMO/ENS/12-05. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: USTRANSCOM.

DIEHL, DANIEL C., *Cost Comparison of B-1B Non-Mission-Capable Drivers Using Finite Source Queuing with Spares*. AFIT/IOA/ENS/12-01. Faculty Advisor: Dr. Jeffery K. Cochran. Sponsor: ACC.

EHASZ, ROBERT F., *Avian Radar: Is it Worth the Cost?* AFIT/ILS/ENS/12-03. Faculty Advisor: Dr. William A. Cunningham. Sponsor: AFMC/CA.

EPPLEY, JOEL E., *Optimizing Aircraft Utilization for Retrograde Operations*. AFIT/IMO/ENS/12-06. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: HQ AMC.

GONYEA, TIMOTHY M., *Planes, Trains and Automobiles: Savings Potential of Utilizing Multi-Modal Transport for Depositioning Cargo in the CONUS*. AFIT/IMO/ENS/12-07. Faculty Advisor: Dr. William A. Cunningham. Sponsor: HQ AMC.

HERVAS, DANIEL M., *Worldwide Express: Exploiting Existing Contract Provisions to Maximize Savings*. AFIT/ILS/ENS/12-04. Faculty Advisor: Dr. William A. Cunningham. Sponsor: AMC.

LEE, JORDAN D., *The Comparison of Strategies Used in the Game of RISK via Markovian Analysis and Monte-Carlo Simulation*. AFIT/IOA/ENS/12-02. Faculty Advisor: Dr. James W. Chrissis. Sponsor: CAA & ASC.

LINDSTROM, CRAIG D., *Examining the Value of Advanced Notification of Cargo Generation for Scheduling Channel Airlift Missions*. AFIT/IOA/ENS/12-03. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: AMC/618 TACC.

LUECK, PETER J., *Creating Cost and Capabilities Analysis Tool for Decision Based Making within Strategic Airlift*. AFIT/IOA/ENS/12-04. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: AMC.

MANUEL, FREDERICK W., *A Cost-Benefit Analysis of Purchasing More C-27J Aircraft for Direct Support*. AFIT/IMO/ENS/12-09. Faculty Advisor: Dr. William A. Cunningham. Sponsor: HQ AMC.

MIDDLETON, CHARLES J., *Risk Assessment Planning for Airborne Systems: An Information Assurance Failure Mode, Effects and Criticality Analysis Methodology*. AFIT/IOA/ENS/12-05. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: ASC.

OBERSON, FREDRIC M., *Analysis of CENTCOM Commercial Intra-Theater Airlift Costs*. AFIT/IMO/ENS/12-11. Faculty Advisor: Dr. William A. Cunningham. Sponsor: HQ AMC.

PURTLE, NATHAN R., *Modeling the 2008 Manning Study for the 618<sup>th</sup> Tanker Airlift Control Center (TACC)*. AFIT/ILS/ENS/12-05. Faculty Advisor: Dr. William A. Cunningham. Sponsor: AMC/618 TACC.

SMITH, BRIAN J., *C-17 Weapons Instructor Course: Unit Basing to Optimize Operational Efficiency and Mission Effectiveness*. AFIT/IMO/ENS/12-12. Faculty Advisor: Dr. William A. Cunningham. Sponsor: AMC/A3 & ACC/USAFWS.

TINNEY, JODI M., *The Effects of Supply Chain Orientation, Supply Chain Management and Collaboration on Perceived Firm Performance*. AFIT/ILS/ENS/12-06. Faculty Advisor: Dr. William A. Cunningham. Sponsor: N/A.

VAIRA, BRADY J., *Estimating Bird/Aircraft Collision Probabilities and Risk Utilizing Spatial Poisson Processes*. AFIT/IOA/ENS/12-06. Faculty Advisor: Dr. Jeffery K. Cochran. Sponsor: AMC.

#### **6.5.4 FACULTY RESEARCH OUTPUT**

Notes: Faculty Bios can be found under their respective department listings. Shared credit for funding awards is indicated by the percentages shown for each faculty member associated with the project.

##### **AHNER, DARRYL K., Department of Operational Sciences**

###### **SPONSOR FUNDED RESEARCH PROJECTS**

“The 618<sup>th</sup> AOC (TACC).” Sponsor: 618 AOC. Funding: \$300,000 – Ahner 20%, Weir 20%, Cunningham 20%, Friend 20%, Miller 20%.

“Combat Analyst Course.” Sponsor: HQ USAF. Funding: \$20,149.

“Test and Evaluation Center for Excellence.” Sponsor: OSD. Funding: \$2,710,000.

“A System of Equations to Capture SSTRO Dynamics.” Sponsor: CAA. Funding: \$400,000 – Ahner 80%, Chrissis 20%.

###### **OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES**

Invited Panel Member and Speaker, Air Force Systems Engineering Conference, Education Panel, 16-18 August 2012.

Ahner, D., “STAT T&E COE,” Invited Speaker, Air Force Test & Evaluation Policy Conference, Los Angeles Air Force Base, 24-27 April 2012.

Ahner D., Parson C., Friend M., “Manpower Simulation, Modeling, and Analysis of the 618<sup>th</sup> Tanker Airlift Control Center,” 80<sup>th</sup> MORS Symposium, Colorado Springs, June 2012.

Ahner D., Parson C., “Individual Deployer Personnel Analysis,” 80<sup>th</sup> MORS Symposium, Colorado Springs, June 2012.

Ahner D., Saie C., “A System of Equations to Capture Security, Stability, Transition, and Reconstruction Operations (SSTRO) Dynamics,” 80<sup>th</sup> MORS Symposium, Colorado Springs, June 2012.

Morris J., Deckro R., Ahner D., Bulutoglu D., Hamill J., “Assessing Information Networks for Social Network Analysis,” 80<sup>th</sup> MORS Symposium, Colorado Springs, June 2012.

##### **BAUER, KENNETH W., Department of Operational Sciences**

###### **SPONSOR FUNDED RESEARCH PROJECTS**

“Advanced Research in Automatic Target Recognition.” Sponsor: AFRL/RV. Funding: \$50,000.

###### **REFEREED JOURNAL PUBLICATIONS**

Rodriguez, J., Miller, J.O., Bauer, K.W. Jr., and Yee, F. “Mathematical Description of a Discrete Event Simulation Using Factor Analytic Method,” *Journal of the Operational Research Society*, Vol. 63, No. 9, pp. 1179-1188, Sep 2012.

Mindrup, F.M., Bauer, K.W., and M.A. Friend, "Extending Robust Parameter Design to Noise by Noise Interactions with an Application to Hyperspectral Imagery," *International Journal of Quality Engineering & Technology*, Vol. 3, No. 1, pp. 1-19, 2012.

Mohd-Zaid, F., Bauer, K.W., and M.A. Friend, "Face Recognition via Ensemble SIFT Matching of Uncorrelated Hyperspectral Bands and Spectral PCT," *International Journal of Tomography & Statistics*, 2012, Vol. 19, Issue No. 1, pp. 1-13.

Leap, N.J. and K.W. Bauer, "A Confidence Paradigm for Classification Systems with Out-of-Library Considerations," *Intelligent Decision Technologies*, Vol. 6, No. 1, 2012, pp. 1-25.

T. Dube, R. Raines, G. Peterson, K. Bauer, M. Grimaila and S. Rogers, "Malware Target Recognition via Static Heuristics," *Computers and Security*, Vol. 31, Issue 1, February 2012, pp. 137-147.

Loeffelholz, B.J. and Bauer, K.W., "A gradient-based method to guard against system degradation in robust parameter design," *International Journal of Quality Engineering and Technology*, Vol. 2, No. 4, pp. 277–290 (2011).

Caulk, R.F., Reyes, K.B., and K.W. Bauer, "Outlier Detection in Hyperspectral Imagery using Closest Distance to Center with Ellipsoidal Multivariate Trimming," *The Journal of Defense Modeling and Simulation: Applications, Methodology, Technology*, April 2012, Vol. 9, No. 2, pp. 163-172.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Mindrup, F.M., Bauer, K.W., and M.A. Friend, "Extending robust parameter design to noise by noise interactions," 80th MORS Symposium, United States Coast Guard Academy, Colorado Springs, Colorado, 11-14 June 2012.

Mohd-Zaid, F., Bauer, K.W., and Friend, M.A. (June 2012). Face recognition via ensemble SIFT matching of uncorrelated hyperspectral bands and spectral PCTs. Military Operations Research Society Symposium. Colorado Springs, CO.

Mohd-Zaid, F., Bauer, K.W., and Friend, M.A. (October 2011). Face recognition via ensemble SIFT matching of uncorrelated hyperspectral bands and spectral PCTs. United States Air Force Analyses, Assessments, and Lessons Learned Symposium 2011. Dayton, OH.

Friesen, K.D., Bihl, T.J., Bauer, K.W., Friend, M.A., and Williams, J.P. "Automatic Target Recognition for Hyperspectral Imagery," 80th MORS Symposium, United States Air Force Academy, CO, 2012.

#### **CHRISSIS, JAMES W., Department of Operational Sciences**

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

J. Lee, J. Chrissis and M. Garrambone, "Analyzing Military Strategies via a Stochastic Wargame," IIE International Conference, Orlando, FL, May 2012.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

"Linear and Nonlinear Programming," 80<sup>th</sup> MORSS Tutorial, Colorado Springs, CO, 11 June 2012.

**COCHRAN, JEFFERY K., Department of Operational Sciences**

REFEREED JOURNAL PUBLICATIONS

Broyles, J.R., Cochran, J.K., and Montgomery, D.C., "A Markov Decision Process to Dynamically Match Hospital Inpatient Staffing to Demand," *IIE Transactions on Healthcare Systems Engineering* 1:2, pp. 116-130 (Oct 2011).

Holzmann, T.W. and Cochran, J.K., "A Stochastic Model to Estimate Joint Fire Fratricide," *Military Operations Research* 17:2, pp. 1-16 (June 2012).

Roche, K.T., Rivera, D.E. and Cochran, J.K., "Control Engineering Framework for Managing Whole Hospital Occupancy," *Mathematical and Computer Modeling* 55:3-4, pp. 1401-1417 (Feb 2012).

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Broyles, J.R. and Cochran, J.K., "Queuing-based Regression Approximation of Hospital Emergency Department Boarding," International Conference on Computers and Industrial Engineering, 6 pages on CD-ROM, Los Angeles, CA (Oct 2011).

**CUNNINGHAM, WILLIAM A., Department of Operational Sciences**

REFEREED JOURNAL PUBLICATIONS

Ryan Rowe, William Cunningham, "Optimal CV-22 Centralized Intermediate Repair Facility Locations and Parts Repair," *Air Force Journal of Logistics*, Vol. XXXV, Nos. 3 and 4, pp. 40-49.

Bryan Main, William Cunningham, Daniel Mattioda, "Analytical Techniques and the Air Force Logistics Readiness Officer," *Journal of Transportation Management*, Vol. 21, No. 2A, Fall 2010, pp. 33-47.

Adam Reiman, Alan Johnson, William Cunningham, "Competitive Advantage and Fuel Efficiency in Aviation," *Journal of Transportation Management*, Vol. 22, No. 2, Fall/Winter 2011, pp. 75-91.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

John Bell, William Cunningham, Joseph Skipper, and Dain Kleiv, "Resource Consolidation and Location Decision Making for Damaged and Disabled Aircraft Recovery," Western Decision Sciences Institute annual Meeting, Hilton Waikoloa Village, Big Island, Hawaii, April 3-6, 2012.

**FRIEND, MARK A., Lt Col, Department of Operational Sciences**

REFEREED JOURNAL PUBLICATIONS

Mindrup, F. M., Bauer, K. W., and M. A. Friend, "Extending Robust Parameter Design to Noise by Noise Interactions with an Application to Hyperspectral Imagery," *International Journal of Quality Engineering & Technology*, Vol. 3, No. 1, pp. 1-19 (2012).

Mohd-Zaid, F., Bauer, K.W., and M.A. Friend, "Face Recognition via Ensemble SIFT Matching of Uncorrelated Hyperspectral Bands and Spectral PCT," *International Journal of Tomography & Statistics*, 2012, Volume 19, Issue Number 1, pp. 1-13.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Ahner D., Parson C., Friend M., "Manpower Simulation, Modeling, and Analysis of the 618<sup>th</sup> Tanker Airlift Control Center," 80<sup>th</sup> MORS Symposium, Colorado Springs, CO., June 2012.

Situ J, Friend M., “Combat Identification of Synthetic Aperture Radar Images using Contextual Features and Bayesian Belief Networks,” 80<sup>th</sup> MORS Symposium, Colorado Springs, CO., June 2012.

Friend, M., Racz, L., “Keeping Graduate Education Relevant: Tying the Operational Air Force to the Classroom,” Air Education and Training Command Symposium, San Antonio, TX., Jan 2012.

**HEILMANN, SHARON G., Lt Col, Department of Operational Sciences**

REFEREED JOURNAL PUBLICATIONS

Heilmann, S. G. (2012). “Can You Hear Me Now? Enhancing Students’ Classroom Communication Preferences via a Telephone Conference Activity,” *Journal of Educators Online*, 9(1).

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Morrisette, G., Thal, A.E., and Heilmann, S.G. (2012). “Developing a Predictive Model for United States Air Force Facility Repair Costs,” Western Decision Science Institute, Big Island, HI, 3-6 April 2012.

Heilmann, S.G., Bartczak, S, E., Hobbs, S., and Leach, S. “Assessing Influences on Perceived Training Transfer: If I Only Knew then What I Need to Know Now,” Midwest Academy of Management, Omaha, NE, 20-22 Oct 2011.

Heilmann, S.G., and Low, M.S. (2011). “An Application of Bloom’s Taxonomy in a Graduate Organizational Behavior Course: A Multi-media Portfolio Project,” Ohio Teaching & Learning Conference: High Impact Learning in a Time of Change, Dayton, OH, 27 Oct 2011.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Ahner, D.K., Heilmann, S.G., & Parson, C. P. (2012). “Individual Deployer Personnel Analysis,” Report presented to Office of the Secretary of Defense, Personnel & Readiness. COA-Report-01-2012.

**HILL, RAYMOND R., Department of Operational Sciences**

SPONSOR FUNDED RESEARCH PROJECTS

“The Science of Test: Advanced Test and Evaluation in Support of the DOD Test and Evaluation Enterprise.” Sponsor: OSD. Funding: \$680,637.

“Force Structure Analysis Tool Development.” Sponsor: AF/A9. Funding: \$80,991.

REFEREED JOURNAL PUBLICATIONS

Meador, D. P. and R. R. Hill. 2011. “Modeling Training Effects Using a Human Performance Taxonomy,” *Human Factors*” Vol. 53, No. 4, 391-402.

Haase, C. L., R. R. Hill, and D. Hodson. 2011. “Using Statistical Experimental Design to Realize LVC Potential in T&E,” *International Test and Evaluation Journal*, Vol. 32, No. 3, 288-297.

Hill, R. R., D. A. Leggio, S. R. Capehart, A. G. Roesener. 2011. “Examining Improved Experimental Designs for Wind Tunnel Testing using Monte Carlo Sampling Methods,” *Quality and Reliability Engineering International*, Vol. 27, Issue 6, 795-803.

Haase, C. L., and R. R. Hill. 2011. “An Algorithmic Foldover Procedure for Nearly Orthogonal Arrays with Projection,” *Journal of Experimental Design and Process Optimization*, Vol. 2, No. 3, 191-201.

MacKenzie, A., J. O. Miller, R. R. Hill, and S. P. Chambal. 2012. "Application of Agent Based Modeling to Aircraft Maintenance Manning and Sortie Generation," *Simulation Modeling Practice and Theory*, Vol. 20, 89-98.

Hill, R. R., Y. K. Cho, and J. T. Moore. 2012. "Problem Reduction Heuristic for the 0-1 Multidimensional Knapsack Problem," *Computers & Operations Research*, Vol. 39, Issue 1, pp. 19-26.

Hill, R. R., J. T. Moore, C. Hiremath and Y. K. Cho. June 2012. "Test Problem Generation of Binary Knapsack Problem Variants and the Implications of their Use," *International Journal of Operations and Quantitative Management*, Vol. 18, No. 2, pp. 105-128.

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

Harper, T. J., Miller, J. O., Hill, R. R., and J. R. Wirthlin. December 2011. "Agent Based Simulation Design for Aggregation and Disaggregation," *Proceedings of the 2011 Winter Simulation Conference*, ed. S. Jain, R. R. Creasey, J. Himmelsbach, K. P. White and M. Fu. IEEE, Piscataway, NJ. 259-270.

Hill, R. R., D. Mattioda and R. Garza. December 2011. "A Simulation Based Analysis of the B-1B's AN/ALQ-161 Maintenance Process," *Proceedings of the 2011 Winter Simulation Conference*, ed. S. Jain, R. R. Creasey, J. Himmelsbach, K. P. White and M. Fu. IEEE, Piscataway, NJ. 2552-2563.

Wolf, S, J. J. Pignatiello, R. R. Hill. May 2012. "A Magnitude Robust Control Chart for Monitoring Process Dispersion," *Proceedings of the 2012 Industrial and Systems Engineering Research*, Orlando, FL.

Mattioda, D., R. Hill, R. Garza. April 2012. "Air Force Hierarchical Maintenance Structure: Discrete Event Simulation," *Proceedings of the Forty First Annual Meeting of the Western Decision Sciences Institute*, Waikoloa Village, Hawaii.

Wooddell, D. A., C. M. Schubert Kabban, R. R. Hill. January 2012. "An Analysis of the Influences of Biological Variance, Measurement Error, and Uncertainty on Retinal Photothermal Damage Threshold Studies," *Proceedings of International Society for Optics and Photonics, 2012 Photonics West Conference*, San Francisco, CA.

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

"Advancing Statistical Methods for Examining Flight Test Performance Data," with J. J. Pignatiello, Jr. and S. Storm. Defense Analysis Seminar XVI, Seoul, South Korea, 23-25 April 2012.

"Using LVC Simulations for Systems Analysis – Experimental and Software Design Issues," with D. Hodson and A. Gutman. Defense Analysis Seminar XVI, Seoul, South Korea, 23-25 April 2012.

"Developing and Validating an Empirical Model of Missile Fragment Flash Characterization," *Quality and Productivity Research Conference*, Long Beach CA, June 2012.

"Developing and Validating an Empirical Model of Missile Fragment Flash Characterization," with D. P. Peyton, M. Koslow and C. Chamberlain, 80<sup>th</sup> Military Operations Research Society Symposium, United States Air Force Academy, Colorado Springs, CO, June 2012 (presented by Capt Brian Stone based on scripted brief provided).

"Using LVC Simulations for Systems Analysis – Experimental and Software Design Issues," with D. Hodson and A. Gutman. 80<sup>th</sup> Military Operations Research Society Symposium, United States Air Force Academy, Colorado Springs, CO, June 2012.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

“Acquisition and Testing, DT/OT Testing: The Need for Two Parameter Requirements,” presented with Alex Gutman at the Air Force Analyses, Assessments and Lessons Learned Symposium, Dayton OH, 24-27 October 2011.

“Ballistic Impact Flash Modeling,” presented at the Air Force Analyses, Assessments and Lessons Learned Symposium, Dayton OH, 24-27 October 2011.

“Advanced Design of Experiments Tutorial,” presented at the Air Force Analyses, Assessments and Lessons Learned Symposium, Dayton OH, 24-27 October 2011.

“Advancing Statistical Methods for Examining Flight Test Performance Data,” with J. J. Pignatiello, Jr. and S. Storm. Defense Analysis Seminar XVI, Seoul, South Korea, 23-25 April 2012.

“Advancing the Science of Test in the Department of Defense,” presented to the graduate program in Industrial Engineering at Clemson University as part of their invited lecture series, 1 Oct 2011.

#### **JOHNSON, ALAN W., Department of Operational Sciences**

##### SPONSOR FUNDED RESEARCH PROJECTS

“Research Analysis and Transition Support to the Director of Logistics and Sustainment.” Sponsor: AFMC. Funding: \$375,000.

##### REFEREED JOURNAL PUBLICATIONS

Guler, C., Johnson, A., and Cooper, M., 2012, “Case Study: Energy Industry Economic Impacts from Ohio River Transportation Disruption,” *Engineering Economist* 57(2): 77-100.

Reiman, A., Johnson, A., and Cunningham, W., 2011, “Competitive Advantage and Fuel Efficiency in Aviation,” *Journal of Transportation Management* 22(2): 75-91.

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

Chua, M., Ogden, J. and Johnson, A., “Simulating the Expeditionary Combat Support System Help Desk,” *Proceedings of the April, 2012 Western Decision Sciences Institute Conference*, Waikoloa, HI.

Ysebaert, S., Johnson, A., Miller, J., and Pettit, T., “An Analytical Approach to Low Observable Maintenance Practices Using Simulation and Marginal Analysis,” *Proceedings of the 2011 Winter Simulation Conference*, Phoenix AZ, 11-14 Dec 2011.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

INFORMS National Meeting, 13-16 November 2011, Charlotte, NC (F. Cardoso and A. Johnson), “Stealthy River Navigation in Jungle Combat Conditions.”

INFORMS National Meeting, 13-16 November 2011, Charlotte, NC (S. Linck and A. Johnson), “Tanker Aircraft Consolidation versus Air Task Order Resiliency.”

#### **MATTIODA, DANIEL D., Maj, Department of Operational Sciences**

##### SPONSOR FUNDED RESEARCH PROJECTS

“Research Analysis and Transition Support to the 478<sup>th</sup> Aeronautical Systems Group.” Sponsor: 478 AESG. Funding: \$785,000 – Mattioda 40%, Ogden 15%, Hill 15%, Sandlin 15%, Randall 15%.



#### REFEREED JOURNAL PUBLICATIONS

Main, B., W. Cunningham, and D. Mattioda, "Analytical Techniques and the Air Force Logistics Readiness Officer," *Journal of Transportation Management*, Vol. 21, No. 2A, Fall 2010, pp. 33-47.

Morrison, P. and D. Mattioda (2011), "Reballasting the KC-135 Fleet for Fuel Efficiency," *Military Operations Research*, Vol. 16, No. 3, pp. 49-64.

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

Hill, R., D. Mattioda and R. Garza. December 2011. "A Simulation Based Analysis of the B-1B's AN/ALQ-161 Maintenance Process," *Proceedings of the 2011 Winter Simulation Conference*, ed. S. Jain, R. R. Creasey, J. Himmelspace, K. P. White and M. Fu. IEEE, Piscataway, NJ, pp. 2552-2563.

Mattioda, D., R. Hill and R. Garza. April (2012), "Air Force Hierarchical Maintenance Structure: Discrete Even Simulation," *Proceedings of the Forty First Annual Meeting of the Western Decision Sciences Institute*, Waikoloa Village, Hawaii.

**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: AFGLSC. Funding: \$250,000.

#### REFEREED JOURNAL PUBLICATIONS

Rodriguez, J., Miller, J.O., Bauer, K.W. Jr., and Yee, F. "Mathematical Description of a Discrete Event Simulation Using Factor Analytic Method," *Journal of the Operational Research Society*, Vol. 63 No. 9, pp. 1179-1188, Sep 2012.

MacKenzie, A., Miller, J.O., Hill, R.R., and Chambal, S.P. "Application of Agent Based Modeling to Aircraft Maintenance Manning and Sortie Generation," *Simulation Modelling Practice and Theory*, Vol. 20 No. 1, pp. 89-98, Jan 2012.

Parson, C.R., Miller, J.O., Weir, J.D., "Simulation and Analysis of Mission Capability Degrades due to Supply for the B-1 Bomber," *The Journal of Defense Modeling and Simulation: Applications, Methodology, Technology*, July 2012, Vol. 9, No. 3. pp. 279-290.

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

Harper, T. J., Miller, J. O., Hill, R. R., and J. R. Wirthlin. December 2011. "Agent Based Simulation Design for Aggregation and Disaggregation," *Proceedings of the 2011 Winter Simulation Conference*, ed. S. Jain, R. R. Creasey, J. Himmelspace, K. P. White and M. Fu. IEEE, Piscataway, NJ, pp. 259-270.

Ysebaert, S., Johnson, A., Miller, J., and Pettit, T., "An Analytical Approach to Low Observable Maintenance Practices Using Simulation and Marginal Analysis," *Proceedings of the 2011 Winter Simulation Conference*, Phoenix AZ, 11-14 Dec 2011.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Miller, J.O., Parson, C.R., and Park, A. "Simulation and Analysis of Maintenance and Supply Processes for the B-1 Strategic Bomber," Midwest INFORMS Conference, The Ohio State University, 1- 2 Aug 2012.

Miller, J.O. "Some AFIT Constructive Combat Simulations," Midwest INFORMS Conference, The Ohio State University, 1- 2 Aug 2012.

**MOORE, JAMES T., Department of Operational Sciences**

REFEREED JOURNAL PUBLICATIONS

Kevin T. Kennedy, Richard F. Deckro, James T. Moore, and Kenneth M. Hopkinson, "Nodal Interdiction," *Mathematical and Computer Modeling*, Volume 54, Issues 11-12, December 2011, pp. 3116-3125.

Compton, M.D., Hopkinson, K.M., Peterson, G.L., and Moore, J.T. "Using Modeling and Simulation to Examine the Benefits of a Network Tasking Order," *The Journal of Defense Modeling and Simulation: Applications, Methodology, Technology* 9:3, pp. 205-217 (2012).

Hill, R. R., Y. K. Cho, and J. T. Moore. 2012. "Problem Reduction Heuristic for the 0-1 Multidimensional Knapsack Problem," *Computers & Operations Research*, Vol. 39, Issue 1, pp. 19-26.

Hill, R. R., J. T. Moore, C. Hiremath and Y. K. Cho. June 2012. "Test Problem Generation of Binary Knapsack Problem Variants and the Implications of their Use," *International Journal of Operations and Quantitative Management*, Vol. 18, No. 2, pp. 105-128.

**OGDEN, JEFFERY A., Department of Operational Sciences**

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Chua, M., Ogden, J. and Johnson, A., "Simulating the Expeditionary Combat Support System Help Desk," *Proceedings of the April, 2012 Western Decision Sciences Institute Conference*, Waikoloa, HI.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Hartman, P.L. and Ogden, J.A. (2012) "The Insourcing Cycle Shift: Applying the Triple Helix Model to Analyze the Effects of Multi-Dimensional Influential Factors on the Purchasing Function," 22<sup>nd</sup> Annual North American Research Symposium on Purchasing and Supply Chain Management, Tempe, Arizona, March 2012.

Underwood, K.D., McConville, M. and Ogden, J.A. (2012) "Comparing Sourcing Strategies in the Face of Electronic Component Obsolescence," 22<sup>nd</sup> Annual North American Research Symposium on Purchasing and Supply Chain Management, Tempe, Arizona, March 2012.

Chalyvidis, C., Morrow, D., Johnson, A. and Ogden, J.A. (2012) "Supply Chain Interoperability: A Framework," 22<sup>nd</sup> Annual North American Research Symposium on Purchasing and Supply Chain Management, Tempe, Arizona, March 2012.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Reviewer, *International Journal of Production Economics*, *Journal of Supply Chain Management*, *International Journal of Operations & Production Management*, *Supply Chain Forum: An International Journal*.

**PIGNATIELLO, JOSEPH J., Department of Operational Sciences**

REFEREED JOURNAL PUBLICATIONS

Perry, Marcus B. and Pignatiello, Joseph J., Jr., "Identifying the Time of Change in a Normal Process Mean with Two-Stage Nested Samples," *Journal of Applied Statistics*, Vol. 39, No. 2, pp. 419-433, 2012.

Perry, Marcus B. and Pignatiello, Joseph J., Jr., "Estimating the Time of Step Change with Poisson CUSUM and EWMA Control Charts," *International Journal of Production Research*, Vol. 49, No. 10, pp. 2857-2871, 2011.

Perry, Marcus B., Mercado, Gary R. and Pignatiello, Joseph J., Jr., "Phase II Monitoring of Covariance Stationary Autocorrelated Processes," *Quality and Reliability Engineering International*, Vol. 27, pp. 35-45, 2011.

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

Pignatiello, Joseph J., Jr., Hill, Raymond R. and Wolf, Sean E., "A Magnitude Robust Control Chart for Monitoring Process Dispersion – II," Proceedings of the Industrial and Systems Engineering Research Conference, Orlando, FL, May 20-24, 2012.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

"Advancing Statistical Methods for Examining Flight Test Performance Data," with R. Hill and S. Storm. Defense Analysis Seminar XVI, Seoul, South Korea, 23-25 April 2012.

**ROBBINS, MATTHEW J., Maj, Department of Operational Sciences**

#### SPONSOR FUNDED RESEARCH PROJECTS

"Investigating Robust Decision Making in SSTRO." Sponsor: AFRL HQ. Funding: \$102,000 – Robbins 50%, Deckro 50%.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Jacobson, S. H., Robbins, M. J., and Shanbhag, U., "A Game-Theoretic Pediatric Vaccine Pricing Model," 2011 INFORMS National Meeting, November 13-16, 2011, Charlotte, NC.

Abbas, A., Herring, S., Robbins, M., Simms, K., and Spetzler, C., 2011, "Peer-To-Peer Decision Training: Teaching Decision Skills to Troubled Teens," *OR/MS Today*, 38(4), 48-53.

**SANDLIN, DORAL E., Lt Col, Department of Operational Sciences**

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

Jordan, J., Weir, J. D., and Sandlin, D. E., "Multiobjective Longest Paths for Military Transportation," Industrial and Systems Engineers Research Conference 2012, Orlando, FL.

**SCHULTZ, KENNETH L., Department of Operational Sciences**

#### REFEREED JOURNAL PUBLICATIONS

Salzarulo, Peter A., Kurt M. Bretthauer, Murray J. Cote and Kenneth L. Schultz, "The Impact of Variability and Patient Information on Health Care System Performance," *Production and Operations Management*, Vol. 20, pp 848-859, 2011.

#### OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Schultz, K.L., Hagtvedt, R., Forgie, S., "Correlates and Predictors of Observed Hand Hygiene Compliance to Reduce Nosocomial Infections," INFORMS National Meeting, Nov 2011, Charlotte, N.C.

Schultz , K.L., Hagtvedt, R., “Empirical Results for Habitual Citizenship Behavior in Hand-Hygiene Compliance,” INFORMS National Meeting, Nov 2011, Charlotte, N.C.

**WEIR, JEFFERY D., Department of Operational Sciences**

SPONSOR FUNDED RESEARCH PROJECTS

“JDPAC and AFIT Distribution Research Proposal (LOC).” Sponsor: USTRANSCOM. Funding: \$250,000.

REFEREED JOURNAL PUBLICATIONS

Chambal, S., Weir, J. D., Kahraman, Y. and Gutman, A., “A Practical Procedure for Customizable One-Way Sensitivity Analysis (COSA) in Additive Value Models,” *Decision Analysis*, December 2011, Vol. 8, No. 4, pp. 303-321.

Hu, M., Weir, J. D., Wu, T., “Decentralized Operation Strategies for an Integrated Building Energy System using a Memetic Algorithm,” *European Journal of Operational Research* ,Vol. 217, Issue 1, 16 February 2012, pp. 185-197.

Parson, C. R., Miller, J. O., Weir, J. D., “Simulation and Analysis of Mission Capability Degradates due to Supply for the B-1 Bomber,” *The Journal of Defense Modeling and Simulation: Applications, Methodology, Technology*, July 2012, Vol. 9, No. 3, pp. 279-290.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Jordan, J., Weir, J. D., and Sandlin, D. E., “Multiobjective Longest Paths for Military Transportation,” Industrial and Systems Engineers Research Conference 2012, Orlando, FL.

Gutman, A., and Weir J. D., “Randomly Generating Weights in a Bounded Region for Sensitivity Analysis,” Industrial and Systems Engineers Research Conference 2012, Orlando, FL.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Leslie, J., Weir, J. D., and Grindey, G., “Joint Operational Support Airlift Center Flight Scheduling Tool,” Military Operations Research Society Symposium, USAF Academy, 2012.

Hu, M., Weir, J.D., Wu, T., “Decentralized Operation Strategies for Building Cluster Using Particle Swarm Optimization,” INFORMS Annual Conference, Charlotte, NC, Nov 2011.

## **7. TECHNOLOGY TRANSFER**

### **7.1. COOPERATIVE RESEARCH AND DEVELOPMENT AGREEMENTS**

“AFMSA/SG9 BAA on Modernization Directorate Research/Development and Innovations,” USAF CRADA 12-AFIT-07, Collaborator: Alion Science and Technology Corp, Faculty Investigator: Dr. Michael E. Miller, Effective Date: 27 December 2011, Term: 12 months.

“Broadband Wireless Technology for Laboratory Use,” USAF CRADA 12-AFIT-16, Collaborator: Nokia Siemens Networks US LLC, Faculty Investigator: Dr. Rusty O. Baldwin, Effective Date: 09 March 2012, Term: 12 months.

“Context Aware Routing and Management Architecture (CARMA) for Airborne Networks,” USAF CRADA 12-AFIT-04, Collaborator: UtopiaCompression Inc., Faculty Investigator: Dr. Kenneth M. Hopkinson, Effective Date: 22 October 2011, Term: 36 months.

“Cyber Defense and Cyber Exploitation,” USAF CRADA 12-AFIT-23, Collaborator: Honeywell International Inc., Faculty Investigator: Dr. Rusty O. Baldwin, Effective Date: 24 July 2012, Term: 12 months.

“Cyber-related topics with the potential to transition to commercial use,” USAF CRADA 12-AFIT-05, Collaborator: Sciences Applications International Corp, Faculty Investigator: Dr. Rusty O. Baldwin, Effective Date: 23 November 2011, Term: 12 months.

“Cyber Technologies,” USAF CRADA 12-AFIT-22, Collaborator: EWA-Government Systems, Inc., Faculty Investigator: Dr. Rusty O. Baldwin, Effective Date: 19 May 2012, Term: 24 months.

“Cyber Technology,” USAF CRADA 12-AFIT-14, Collaborator: Sierra Nevada Corp, Faculty Investigator: Dr. Rusty O. Baldwin, Effective Date: 16 February 2012, Term: 12 months.

“Extreme Wear-Resistant Materials: Phase II,” USAF CRADA 12-AFIT-18, Collaborator: CK-Technologies, Faculty Investigator: Dr. Anthony N. Palazotto, Effective Date: 06 June 2012, Term: 48 months.

“Joint Self Defending Systems Research,” USAF CRADA 12-AFIT-03, Collaborator: SCADA Security Innovation Inc., Faculty Investigator: Dr. Rusty O. Baldwin, Effective Date: 23 November 2011, Term: 34 months.

“Lighter-Than-Air Aircraft – Feasibility Study,” USAF CRADA 12-AFIT-09, Collaborator: Mr. Matt Johnson, Faculty Investigator: Dr. Anthony N. Palazotto, Effective Date: 11 January 2012, Term: 24 months.

“Methods to Unlock PIM/PUK Codes from SIM Cards DHS-H-SB011.2-003 Subtopic 2,” USAF CRADA 12-AFIT-12, Collaborator: EWA-Government Systems, Inc., Faculty Investigator: Dr. Rusty O. Baldwin, Effective Date: 26 January 2012, Term: 18 months.

“Missile Development Concepts and Solutions,” USAF CRADA 12-AFIT-01, Collaborator: Lockheed Martin Missiles and Fire Control, Faculty Investigator: Dr. Mark F. Reeder, Effective Date: 12 October 2011, Term: 48 months.

“Physics-based Life Prediction Model Incorporating Environmental Effects for SiC/SiC Ceramic Matrix Composites,” USAF CRADA 12-AFIT-11, Collaborator: Multi-Scale Design, Inc., Faculty Investigator: Dr. Shankar Mall, Effective Date: 11 January 2012, Term: 24 months.

“Quantum Key Distribution,” USAF CRADA 12-AFIT-24, Collaborator: Battelle Memorial Institute, Faculty Investigator: Dr. Michael R. Grimaila, Effective Date: 02 May 2012, Term: 12 months.

“Random Matrix Theory Methods for Integrated Circuits,” USAF CRADA 12-AFIT-17, Collaborator: Siena College, Faculty Investigator: Dr. Mary Y. Lanzerotti, Effective Date: 30 March 2012, Term: 36 months.

“Research & Development in Directed Energy Applications,” USAF CRADA 12-AFIT-20, Collaborator: MZA Associates Corporation, Faculty Investigator: Dr. Steven T. Fiorino, Effective Date: 24 August 2012, Term: 36 months.

“Robotic Technology,” USAF CRADA 12-AFIT-21, Collaborator: Yaskawa America, Inc., Faculty Investigator: Dr. Rusty O. Baldwin, Effective Date: 26 April 2012, Term: 12 months.

“Transition of Cyber-based Circuits, Systems and Operations to Commercial Use,” USAF CRADA 12-AFIT-10, Collaborator: Altera, Inc., Faculty Investigator: Dr. Rusty O. Baldwin, Effective Date: 11 January 2012, Term: 12 months.

“Transitioning Cyber-Related Technologies to Commercial Applications,” USAF CRADA 12-AFIT-13, Collaborator: EDaptive Computing Inc., Faculty Investigator: Dr. Rusty O. Baldwin, Effective Date: 16 February 2012, Term: 24 months.

“Transport of Nanoparticles in Groundwater,” USAF CRADA 12-AFIT-25, Collaborator: Central State University, Faculty Investigator: Dr. Mark N. Goltz, Effective Date: 28 July 2012, Term: 18 months.

“Transport of Nanoparticles in Groundwater and Use of Nanotechnology for Contaminated Water Treatment,” USAF CRADA 12-AFIT-15, Collaborator: Wright State University, Faculty Investigator: Dr. Mark N. Goltz, Effective Date: 21 March 2012, Term: 18 months.

“TS Iridium Short Burst Data Modem and Satellite Communications,” USAF CRADA 12-AFIT-19, Collaborator: Celestech, Inc., Faculty Investigator: Dr. Eric D. Swenson, Effective Date: 12 April 2012, Term: 24 months.

“UC-AFIT Research Collaboration in Nuclear and Radiological Engineering Physics,” USAF CRADA 12-AFIT-02, Collaborator: University of Cincinnati, Faculty Investigator: Maj Benjamin R. Kowash and Dr. James C. Petrosky, Effective Date: 14 October 2011, Term: 60 months.

“Upward Flow Constructed Wetland System for Remediation of Groundwater Contaminated with Chlorinated Ethenes,” USAF CRADA 12-AFIT-06, Collaborator: Wright State University & Cox Colvin, Inc., Faculty Investigator: Dr. Michael L. Shelley, Effective Date: 5 December 2011, Term: 36 months.

## **7.2. EDUCATION PARTNERSHIP AGREEMENTS**

“EPA - Equipment Transfer & Research,” USAF CRADA AFIT EPA 2012-01, Collaborator: Central State University, Faculty Investigator: Dr. Heidi R. Ries, Effective Date: 06 June 2012, Term: 24 months.

## **7.3. PATENT LICENSE AGREEMENTS**

“PLA (Exclusive) - ESCAPE Technology,” USAF CRADA AFIT PLA 2012-01, Collaborator: SCADA Security Innovation Inc., Faculty Investigator: Dr. Rusty O. Baldwin, Effective Date: 13 August 2012, Term: 227 months.

## APPENDICES

### APPENDIX A: POST-DOCTORAL AND OTHER RESEARCH ASSOCIATES' CREDENTIALS

**ARMENT, ANTHONY**, Visiting Research Associate under the Summer Faculty Fellowship Program, AFIT Appointment Date: May-Sep 2012 (AFIT/ENV); Associate Professor of Biology at Central State University; BS, Urbana University, PhD, Wright State University. Research Interests: Bioremediation of pollutants through microbial degradation, symbiotic relationships in degradation between microbial communities and the rhizosphere.

**AZGHANDI, SEIF**, Post-Doctoral Research Associate, Department of Engineering, AFIT Appointment Date: 2012 (AFIT/ENG); BS, Computer Engineering, 1989; MS, Computer Science, University of Colorado at Denver, Denver, CO, 2006; PhD, Computer Science, University of Denver, Denver, CO, expected 2013. Dr. Azghandi's interests include cyber security issues involving Advanced Metering Infrastructure, parallel computing involving Maestro Chip, and model-based testing and regression testing. Tel. 303-717-4506. email: [sazghand@afit.edu](mailto:sazghand@afit.edu)

**BASU, SANTASRI**, Post-Doctoral Research Associate, Department of Engineering Physics, AFIT Appointment Date: 2011 (AFIT/ENP); B.S., Jadavpur University, India, 2000; M.S., New Mexico State University, 2005; PhD, New Mexico State University; 2008; Dr. Basu's work is focused on modeling of laser beam propagation. Tel. 937-255-3636 x4903. email: [Santasri.Basu.ctr.in@afit.edu](mailto:Santasri.Basu.ctr.in@afit.edu)

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

S. Basu, S.J. Cusumano, M.W. Hyde, M.A. Marciniak, and S.T. Fiorino, "Validity of using Gaussian Schell model for extended beacon studies," (*Proc. of SPIE* Vol. 8380 83800E-1) SPIE Defense, Security and Sensing Symposium, Baltimore, MD, 23-26 April 2012. [CDE]

**BOGLE, ANDREW**, Post-Doctoral Research Associate, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2010 (AFIT/ENG); BS, MS, & PhD; Electrical Engineering, Michigan State University. His interests include technical document development, EMC measurements, antenna test ranges, theoretical electromagnetics, field engineering, cleanroom operations, experimental design and testing, cryogenic applications, and anechoic chamber experiments.

#### REFEREED JOURNAL PUBLICATIONS

M. Hyde, M. Havrilla, A. Bogle and E. Rothwell, "Nondestructive material characterization of a free-space-backed magnetic material using a dual-waveguide probe," *IEEE Transactions on Antennas and Propagation*, Vol. 60, No. 2, pp.1009-1019, February 2012.

**BRANT, ADAM T.**, National Research Council Post-Doctoral Fellow, AFIT Appointment Date: 2012 (AFIT/ENP); BS, Physics, Slippery Rock University, 2007; PhD, Physics, West Virginia University, 2011. Dr. Brant's work is focused on point defect identification in materials using electron paramagnetic resonance; materials of interest include wide-bandgap radiation detector crystals, oxides for energy production, and photorefractive materials for optical sensing and detection systems. Tel. 937-255-3636 x4741. email: [Adam.Brant.ctr@afit.edu](mailto:Adam.Brant.ctr@afit.edu)

#### REFEREED JOURNAL PUBLICATIONS

B. E. Kananen, A. T. Brant, J. W. McClory, J. C. Petrosky, "Characterization of Neutron Induced Defects in Lithium Tetraborate Using Electron Paramagnetic Resonance and Thermoluminescence," *Journal of Radiation Effects, Research and Engineering*, Vol. 30, No. 1, pp. 173-178 (February 2012).

J. D. Rowley, J. K. Pierce, A. T. Brant, L. E. Halliburton, N. C. Giles, P. G. Schunemann, and A. D. Bristow, "Broadband Terahertz Pulse Emission from ZnGeP<sub>2</sub>," *Optics Letters* 37, pp. 788-790 (March 2012).

A. T. Brant, B. E. Kananan, M. K. Murari, J. W. McClory, J. C. Petrosky, V. T. Adamiv, Ya. V. Burak, P. A. Dowben, and L. E. Halliburton, "Electron and hole traps in Ag-doped lithium tetraborate ( $\text{Li}_2\text{B}_4\text{O}_7$ ) crystals," *Journal of Applied Physics*, Vol. 110, Issue 9, 093719 (November 2011).

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

Brant E. Kananan, Adam T. Brant, Douglas A. Buchanan, John W. McClory, "Analysis of Neutron Induced Defects in Silver Doped Lithium Tetraborate," *IEEE Nuclear Science Symposium 2011*, Paper No. 2596, Valencia, Spain, October 2011.

**CLINTON, JUSTIN**, Post-Doctoral Research Associate, Department of Engineering Physics, AFIT Appointment Date: 2012 (AFIT/ENP); BS, Nuclear Engineering/Engineering Physics, Rensselaer Polytechnic Institute, 2004; PhD, Nuclear Engineering, Rensselaer Polytechnic Institute, 2011. Dr. Clinton's work is focused on radiation detection and modeling of neutron detection. Tel. 937-255-3636 x4586. email: [Justin.Clinton.ctr@afit.edu](mailto:Justin.Clinton.ctr@afit.edu).

**FRANCIS, SARAH A.**, Post-Doctoral Research Associate, Department of Engineering Physics, AFIT Appointment Date: 2012 (AFIT/ENP); BS, Electrical Engineering, Western Kentucky University, 2006; MS, Electrical Engineering, Vanderbilt University, 2008; PhD, Electrical Engineering, Vanderbilt University, 2011. Dr. Francis' research is focused on semiconductor device physics, semiconductor performance and reliability analysis, and effects of radiation. Tel. 937-255-3636 x4698. x4586. email: [Sarah.Francis.ctr@afit.edu](mailto:Sarah.Francis.ctr@afit.edu)

**KANEL, SUSHIL R.**, National Research Council Post-Doctoral Fellow, AFIT Appointment Date: 2010 (AFIT/ENV); BE, Civil Engineering, Tribhuvan University (Nepal), 1992; MS, Environmental Science and Engineering, Gwangju Institute of Science and Technology (South Korea), 2001; PhD, Environmental Science and Engineering, Gwangju Institute of Science and Technology (South Korea), 2006. Dr. Kanel's work is focused on the fate and transport of nanomaterials in the subsurface, as well as the application of nanomaterials for water remediation. Tel. 937-255-3636 x4568 (DSN 785-3636 x4568), email: [Susil.Kanel.ctr@afit.edu](mailto:Susil.Kanel.ctr@afit.edu)

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

Kanel, S.R., J. Dagher, T. Meidinger, I.E. Sizemore, L. Racz, C.A. Impellitteri, and M.N. Goltz, Fate and transport of silver nanoparticles and silver ions in saturated porous media: Laboratory experiments and modeling, 244th American Chemical Society National Meeting & Exhibition, Philadelphia, PA, 19-23 August 2012.

Stevens, T.J., D.S. Kim, S.R. Kanel, and M.N. Goltz, Stabilizing acetylcholinesterase on carbon electrodes to produce effective biosensors, 244th American Chemical Society National Meeting & Exhibition, Philadelphia, PA, 19-23 August 2012.

Flory, J.R., S.R. Kanel, L. Racz, C.A. Impellitteri, R.G. Silva, and M.N. Goltz, Influence of pH on the Transport of Silver Nanoparticles in Saturated Porous Media: Lab Experiments and Modeling, 86th ACS Colloid & Surface Science Symposium, Johns Hopkins University, MD, 11- 13 June 2012.

Kanel, S.R., J. Flory, L. Racz, M.N. Goltz, Road towards Sustainability: Understanding Silver Nanoparticle and Silver Ion Transport in Saturated Porous Media, World Environmental and Water Resources Congress, Albuquerque, NM, 20-24 May 2012.

Kanel, S.R., J. Flory, L. Racz, C.A. Impellitteri, M. Nadagouda, C. Patterson, R.G. Silva, J. Huang and M.N. Goltz, Fate and transport of silver nanoparticles and related products in saturated porous media, 243rd American Chemical Society National Meeting & Exhibition, San Diego, CA, 25-29 March 2012.



McPherson, A., S.R. Kanel, K.M. Danner, A. Agrawal, M.N. Goltz, Degradation of Carbon Tetrachloride by Stabilized Bimetallic Palladium-Zero-Valent Iron (Pd-nZVI) Nanoparticles, 243rd American Chemical Society National Meeting & Exhibition, San Diego, CA, 25-29 March 2012.

Flory, J., S.R. Kanel, L. Racz, C.A. Impellitteri, and M.N. Goltz, Influence of pH on the transport of silver nanoparticles in saturated porous media, USAF ASC/AFRL Engineered Nanomaterials Environment, Safety, & Health Workshop, Fairborn, OH, 10-12 January 2012.

McPherson, A., K. Danner, A. Agrawal, S.R. Kanel, and M.N. Goltz, Use of Stabilized Bimetallic Nanoscale Zerovalent Iron to Destroy Water Contaminants, 9th Annual Nano Technology for Defense Conference, Bellevue WA, 24-27 October 2011.

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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	711 <sup>th</sup> Human Performance Wing Human Effectiveness Directorate
711 HPW/USAFSAM	711 <sup>th</sup> Human Performance Wing U.S. Air Force School of Aerospace Medicine
ACC	Air Combat Command
AESG	Aeronautical Systems Group
AETC	Air Education and Training Command
AFCEE	Air Force Center for Environmental Excellence
AFCESA	Air Force Civil Engineer Support Agency
AFGLSC	Air Force Global Logistics Support Center
AFIT	Air Force Institute of Technology
AFLCMC	Air Force Life Cycle Management Center
AFMC	Air Force Materiel Command
AFMSA	Air Force Medical Support Agency
AFNWC	Air Force Nuclear Weapons Center
AFRL	Air Force Research Laboratory
AFRL/AFOSR	AFRL/Air Force Office of Scientific Research
AFRL/RB	AFRL/Air Vehicles Directorate
AFRL/RD	AFRL/Directed Energy Directorate
AFRL/RQ	AFRL/Aerospace Systems 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
AFSEO	Air Force Seek Eagle Office (46 SK/SKE)
AFSPC	Air Force Space Command
AFTPS	Air Force Test Pilot School
AFTAC	Air Force Technical Applications Center
AHS	American Helicopter Society
AIAA	American Institute of Aeronautics and Astronautics
AMC	Air Mobility Command
AMCOM	Aviation and Missile Command
AMSAA	Army Material Systems Analysis Activity
ASME	American Society of Mechanical Engineers
ASC	Aeronautical Systems Center
AU	Air University
CAA	Center for Army Analysis
DAGSI	Dayton Area Graduate Studies Institute
DARPA	Defense Advanced Research Projects Agency
DHS	Department of Homeland Security
DIA	Defense Intelligence Agency
DOD	Department of Defense
DOE	Department of Energy
DTRA	Defense Threat Reduction Agency
EUCOM	United States European Command
HELJTO	High Energy Laser Joint Technology Office
IEEE	Institute of Electrical and Electronics Engineers
INCOSE	International Council on Systems Engineering
JASPO	Joint Aircraft Survivability Program Office
JPL	Jet Propulsion Laboratory
LTS	Laboratory for Telecommunications Sciences

MIT	Massachusetts Institute of Technology
MORS	Military Operations Research Society
NASA	National Aeronautics and Space Administration
NASIC	National Air and Space Intelligence Center
NFESC	Naval Facilities Engineering Service Center
NGA	National Geospatial-Intelligence Agency
NNSA	National Nuclear Security Administration
NPS	Naval Postgraduate School
NSA	National Security Agency
NSF	National Science Foundation
PNNL	Pacific Northwest National Laboratory
ONR	Office of Naval Research
OSD	Office of the Secretary of Defense
ROKAF	Republic of Korea Air Force
SAF	Office of the Secretary of the Air Force
SERDP	Strategic Environmental and Development Program
SMC	Space and Missiles Systems Center
SPIE	The International Society for Optical Engineering
TuAF	Turkish Air Force
USAF	United States Air Force
USAFA	U.S. Air Force Academy
USSTRATCOM	United States Strategic Command
USTRANSCOM	United States Transportation Command
WPAFB	Wright-Patterson Air Force Base
WSU	Wright State University

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