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Air Force Institute of Technology Research Report 2011

Office of Research and Sponsored Programs, Graduate School of Engineering and Management, AFIT

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Air Force Institute of Technology

Research Report 2011

Period of Report: 1 October 2010 to 30 September 2011

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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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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research@afit.edu

or visit the AFIT website: www.afit.edu



Air Force Institute of Technology Research Report 2011 Foreword

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

AFIT maintains active partnerships with our Air Force's organizations and operational communities as well as the DOD and other federal agencies to maximize the contributions of our research programs to national needs. Our faculty and students also engage in collaborations with researchers at universities throughout the nation to advance the state-of-the-art in a variety of disciplines. AFIT cooperates with commercial enterprises to ensure timely transfer of new technology to US industry through Cooperative Research and Development Agreements (CRADAs) whenever appropriate.

This Research Report is prepared annually to summarize the significant contributions of this institution; to solicit continued involvement and support from our Air Force, DOD, and other federal partners; and to encourage new sponsors to participate in AFIT's research programs. AFIT welcomes new opportunities to engage in research projects that are of mutual interest to our customers, faculty, and students. Additional information is available at <http://www.afit.edu/en/enr/index.cfm>.

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



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1. INTRODUCTION

1.1. OVERVIEW

This Research Report presents the FY11 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.

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

1.2. THE GRADUATE SCHOOL OF ENGINEERING AND MANAGEMENT RESEARCH COLLABORATION

As detailed in the 2011-2012 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 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:

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

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

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

Acoustic Wave Scattering
Bayesian Analysis
Biostatistics
Nonlinear Waves
Optimization
Design of Experiments
Electromagnetics

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

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
Product Design and Development
Project Management
Reliability Engineering
Strategic Decision Support
Structural Health Monitoring
Sustainability and Life Cycle Assessment
Systems Engineering

Another avenue for educational and research collaboration with the Graduate School of Engineering and Management is through association with one or more of **AFIT's Research Centers**. A brief listing of each Center's research or educational areas of emphasis appears below. Please contact the Centers directly (see Ch. 6) or visit <http://www.afit.edu/research.cfm> for further information.

The [Advanced Navigation Technology \(ANT\) Center](#) is a forward-looking 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/NAVPAR.

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.

Additional AFIT Center

The [Air Force Center for Systems Engineering \(AF CSE\)](http://www.afit.edu/cse/) is a directorate within AFIT that is external to the Graduate School of Engineering and Management. AF CSE is the recognized Center of Excellence for Systems Engineering (SE) within the Air Force and the Department of Defense. The mission of the Center is to shape the future of systems engineering with the goal of improving our ability to deliver war-fighting capabilities. We accomplish this by conceptualizing new processes, practices, tools, and resources through research, education, and consultation. Additional information about AF CSE can be found at <http://www.afit.edu/cse/>. AF CSE is included here for completeness, but no AF CSE data is included in the remainder of this report.

2. SPECIAL RECOGNITIONS

2.1. FACULTY FELLOWS

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

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

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

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

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

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

Hengehold, Robert L., Professor of Physics, Department of Engineering Physics, Fellow of the American Physical Society.

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

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

Maybeck, Peter S., Professor Emeritus of Electrical Engineering, Department of Electrical and Computer Engineering, Fellow of the Institute of Electrical and Electronic Engineers.

Pachter, Meir, Professor of Electrical Engineering, Department of Electrical and Computer Engineering, Fellow of the Institute of Electrical and Electronic Engineers.

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

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

Pignatiello, Joseph J., Professor of Operations Research, Department of Operational Sciences, Fellow of the American Society for Quality.

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

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

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

Thomas, Marlin U., Dean, Graduate School of Engineering and Management, Air Force Institute of Technology, Fellow of the Institute of Industrial Engineers, Fellow of the American Society 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., LTC, Registered Professional Engineer (PE), Commonwealth of Virginia

Akers, Geoffrey A., Lt Col, Level 2 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., Capt, Certified Information Systems Security Professional (CISSP)

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

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

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

Butts, Jonathan W., Capt, 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., Maj, 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)2; Vienna, VA

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

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

Johannes, Tay W., Professional Engineer, State of Montana

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

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., Assessing Wireless Networks (GAWN) Certification from the Sys Admin, Audit, Network, Security (SANS) Institute's Global Information Assurance Certification (GIAC) Program

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

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

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

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

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

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

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

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

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

Tuttle, Ronald F., APDP Level III Certification – Systems Planning, Research, Development and Engineering

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

Wirthlin, Joseph R., Lt Col, Certified Systems Engineering Professional (CSEP), APDP SPRDTE Level III, NRO Systems Engineering Certification, Level III, APDP Program Management Level II, AFSSO21 Green Belt (2010)

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

ACEBAL, ARIEL, Lt Col

2011 Southwestern Ohio Council for Higher Education (SOCHE) Award for Excellence in Teaching.

BADIRU, ADEDEJI B.

2011 Federal Employee of the Year Award in the Managerial Category, International Public Management Association.

BAUER, KENNETH W., Jr.

2010 Air Force Analyst Lifetime Achievement Award, Dec 2010. The Air Force Analyst Lifetime Achievement Award recognizes those scientific and research analysts or government contractors whose career accomplishments and achievements have had a significant effect on the Air Force Analytic Community.

Best Paper Award. Dube, T., Raines, R.A., Peterson, G.L., Bauer, K.W., Grimaila, M.R. and Rogers, S.K., "Malware Type Recognition and Cyber Situational Awareness," International Workshop on "Mission Assurance: Tools, Techniques, and Methodologies," 2010 IEEE Second International Conference on Social Computing, Minneapolis MN, 2010, pp 938-943.

BOREL-DONOHUE, CHRISTOPH C.

2011 DigitalGlobe International Award, "*Vegetative canopy parameter retrieval using 8-band data.*"

BORGHETTI, BRETT J., Lt Col

AFIT Outstanding Military Faculty Award, presented by the Military Officers Association of American (CY2010).

AFIT Field Grade Officer of the Quarter, 3rd Quarter 2010.

BUTTS, JONATHAN W., Capt

AFIT Company Grade Officer of the Quarter, October-December 2010.

COBB, RICHARD G.

Best Paper Certificate of Merit, AIAA Aerospace Sciences Meeting, 2011.

COCHRAN, JEFFERY K.

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

FRIEND, MARK A., Lt Col

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

GRMAILA, MICHAEL R.

2010 AFIT Team of the Year - Cyber 200 and 300 Professional Continuing Education Team, 2011.

HILL, RAYMOND R.

2010 Gage H. Crocker Outstanding Professor Award, June 2011. This Board of Visitors' award is given to the individual who made the most significant contribution to the AFIT mission. Consideration shall include excellence in teaching, curriculum development, educational innovation, consulting, research and any other achievements which enhance or contribute to maintaining the excellence of AFIT programs.

HOPKINSON, KENNETH M.

2010 Elevated to Senior Member Status by the Institute of Electrical and Electronics Engineers (IEEE).

2010 Elevated to Senior Member Status by the Association for Computing Machinery (ACM).

MOORE, JAMES T.

2011 Air Force Analyst Lifetime Achievement Award, Sep 2011. The Air Force Analyst Lifetime Achievement Award recognizes those scientific and research analysts or government contractors whose career accomplishments and achievements have had a significant effect on the Air Force Analytic Community.

2010 MORS Best Paper Award. Burks, Robert E., James T. Moore, J. Wesley Barnes, and John E. Bell, "Solving the Theater Distribution Problem Using Tabu Search," *Military Operations Research* 15(4): 5-26 (2010). Selected in 2011 for the MORS Journal 2010 best paper award.

MULLINS, BARRY E.

2010 C. Holmes MacDonald Outstanding Electrical and Computer Engineering Teacher Award, sponsored by IEEE and Eta Kappa Nu, 2011.

AFIT Team of the Year for 2010 – Cyber 200 and 300 Professional Continuing Education, 2011.

OGDEN, JEFFREY A.

2010-2011 Instructor of the Year Award awarded by the Advance Study in Air Mobility Class of 2011, Joint Base McGuire-Dix-Lakehurst, New Jersey.

PALAZOTTO, ANTHONY N.

Outstanding Engineer and Science Award from the Affiliate Society of Dayton, April 2011.

PETROSKY, JAMES C.

2010-2011 Wright Memorial Chapter, Air Force Association, General Bernard A. Schriever Award, June 2011. This Board of Visitor's award is given in recognition of a person who advances aerospace power, technology, doctrine, or the Air Force as a profession.

PETTIT, TIMOTHY J., Lt Col

2010 Field Grade Officer of the Year, Air Force Institute of Technology, January – December 2010, awarded 2011.

POLANKA, MARC D.

AIAA Outstanding Section Award, Very Large Category, 1st Place, 2011.

AIAA Public Policy Award, Very Large Category, 2nd Place, 2011.

RAQUET, JOHN F.

“Best Paper in Conference” award for paper entitled, “Magnetic Field Navigation in an Indoor Environment,” Ubiquitous Position Indoor Navigation and Location Based Service (UPINLBS) Conference, Kirkkonummi (Helsinki), Finland, October 2010.

RIES, HEIDI R.

Air Force winner of the 2011 Women's History Month Science, Technology, Engineering and Mathematics Role Model Award, Civilian category.

Air Force winner of the 2011 National Latina Distinguished Service Award.

ROBBINS, MATTHEW J., Maj

2011 Pritsker Doctoral Dissertation Award – First Place from the Institute of Industrial Engineers (IIE). The annual IIE Pritsker Doctoral Dissertation Award recognizes outstanding graduate research in the field of industrial engineering. Dr. Robbins' dissertation, "Exploring Pediatric Immunization Markets Using Operations Research and Game Theory," was advised by Dr. Sheldon H. Jacobson.

SCHECHTMAN, GREGORY M., Lt Col

2011 International Conference on Learning and Administration in Higher Education Best Presentation.

2011 Teacher of the Year, Department of Systems and Engineering Management.

SILVIUS, MARK D., Maj

Air Force Institute of Technology Field Grade Officer of the Quarter, October-December 2010.

SKIPPER, JOSEPH B., Lt Col

Southwestern Ohio Council for Higher Education (SOCHE) Faculty Excellence in Teaching Award, 2011.

***TORVIK, PETER J.**

International Gas Turbine Institute Award for Best Paper in Structures and Dynamics (Joint with S. Filippi, GE Aviation), 2011.

WIRTHLIN, JOSEPH R., Lt Col

2011 Faculty Excellence in Teaching, Southwestern Ohio Council for Higher Education.

YAMAMOTO, DIRK P., Lt Col

2011 Best Presentation- Force Health Protection, AF Medical Service Research Symposium.

*Emeritus faculty

2.3.2. STUDENTS

BISHOP, BENJAMIN

Air Force Institute of Technology Mervin E. Gross Award, 2011.

Air Force Heritage Society Bryce Poe II Award, 2011.

BOHAN, BRIAN T.

Commandant's Award for "The Most Exceptional Master's Thesis," 2011.

Dean's Award recipient from the Aero/Astro Department, 2011.

AIAA Graduate Student Award for Research Excellence 2011.

BRIGGS, GREGORY

Best Technical Presentation, 2011 Dayton-Cincinnati Aerospace Sciences Symposium.

COLLINS, NATHAN

2011 Navigation Research Excellence Award, March 2011.

DAILEY, WHITMAN

2011 Dean's Award – Thesis Title: "Ray Next Event Estimator Transport of Primary and Secondary Gamma Rays," Department of Engineering Physics (March 2011).

DICKENS, JOHN M.

2011 Jerome G. Peppers, Jr. Outstanding Student Award, International Society of Logistics (SOLE), June 2011, given in recognition of academic record and research significantly contributing to the field of Logistics. Thesis: "Central Command Rest and Recuperation Hub-to-Hub Airlift Network Analysis."

DICKERSON, STEPHEN M.

Best Presentation (Aeroelasticity), 2011 Dayton-Cincinnati Aerospace Sciences Symposium.

DUNCAN, MARK

Air Force Institute of Technology Student Association Ivan B. Thompson Award for Leadership and Service, March 2011.

FOSTER, JESSE

2011 American Nuclear Society Thesis Award – Thesis Title: "Radiation Effects on the Electrical Properties of Hafnium Oxide Based on MOS Capacitors," Department of Engineering Physics (March 2011).

GARCIA, ERIC W.

Association of Old Crows Academic Research Excellence Award in Information Superiority, 2011.

GILBERT, RONALD E.

2011 Louis F. Polk Award, sponsored by the National Defense Industrial Association (NDIA), awarded at graduation, June 2011, in recognition of the student who has made an advanced contribution in their professional field in direct furtherance of the objectives of NDIA. June Graduate Research Project title: "Strategic Implications of US Fighter Force Reductions: Air-to-Air Combat Modeling Using Lanchester Equations."

GOMES, KESIA G.

2010 International Student of the Year, AFIT Graduate School of Engineering and Management, March 2011.

HOCKING, HANNAH

2011 MASINT Committee Award of Academic Excellence – Thesis title: "TOF-SIMS for Rapid Nuclear Forensics Evaluation of Uranium Oxide Particles," Department of Engineering Physics (March 2011).

JONES, BRADLEY

2011 MASINT Committee Award of Academic Excellence - Thesis title: "Investigation of YAG:Ce Scintillating Fiber Properties Using Silicon Photomultipliers," Department of Engineering Physics (March 2011).

LIEVSAY, JAMES

2011 Advanced Technical Intelligence Association's (ATIA) Outstanding Graduate Award at the Air Force Institute of Technology for MASINT Studies and Research - Thesis title: "Simultaneous Range/Velocity Detection with an Ultra-Wideband Random Noise Radar Through Fully Digital Cross-Correlation in the Time Domain," March 2011.

KEATON, GRANT

2011 Society of Cost Estimating and Analysis (SCEA), Cost Analysis Award.

KLEIV, DAIN O.

2011 Jerome G. Peppers, Jr. Outstanding Student Award, International Society of Logistics (SOLE), June 2011, given in recognition of academic record and research significantly contributing to the field of Logistics. Graduate Research Project Title: "Examination of Crash, Damaged, Disabled Aircraft Recovery (CDDAR) Resources."

KURTTAS, YASMEN

International Student of the Quarter, Fall 2010, AFIT Graduate School of Engineering and Management, January 2011.

LEBAY, KENNETH D.

AIAA Student Paper of the Month - December 2010.

MESSER, ADAM J.

2011 Dean's Award, March 2011, for the exceptional master's thesis by a graduating student in the Department of Operational Sciences. Thesis: "Contextual Detection of Anomalies within Hyperspectral Images."

MOHD-ZAID, MOHD F.

2011 Military Operations Research Society (MORS) Award, June 2011, awarded for the graduate thesis judged to demonstrate the best application of operations research methodology or theory development to a military problem. Thesis: "Face Recognition via Ensemble SIFT Matching of Uncorrelated Hyperspectral Bands and Spectral PCTS."

ROSS, STEVEN

Best Technical Presentation, 2011 Dayton-Cincinnati Aerospace Sciences Symposium.

TALAFUSE, THOMAS P.

2011 Military Operations Research Society (MORS) Award, March 2011, awarded for the graduate thesis judged to demonstrate the best application of operations research methodology or theory development to a military problem. Thesis: "Empirical Characterization of Ballistic Impact Flash."

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 2011 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 81 questionnaires returned out of the 282 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)	98%
The thesis work was: Highly significant Significant Slightly significant Not significant	42% 52% 6% 0%
Average man-years of effort saved by the sponsors.	0.958
Average cost avoided per thesis/dissertation by the sponsors.	\$132,065
Total cost avoided for all theses and dissertations sponsored (estimated).	\$41M
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 81 returned questionnaires, 9 respondents did not list Rank/GS levels. These percentages represent only those which responded.	1% 20% 44% 19% 5%



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.

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 FY11, 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)*	135	14	36	23	20	23	19
Refereed Publication Authorships***	206	17	63	52	21	10	43
Refereed Conferences on the Basis of Full Paper Review***	164	5	63	31	28	28	9
Refereed Conferences on the Basis of Abstract Review***	173	4	34	44	20	23	48
Sponsor Funded Projects**	206	11	72	40	18	15	47
Books & Chapters of Books***	16	1	5	3	1	5	1
Patents	7	-	3	1	-	3	-
Doctoral Dissertations Advised	31	2	11	8	2	-	8
Master's Theses Advised	274	2	76	40	37	55	64
Graduate Research Papers Advised	48	-	12	-	32	4	-

*FTE: Full-time equivalent

**Three 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	93	23	25	9	17	19
Refereed Publication Authorships*	52	10	8	13	2	19
Refereed Conferences on the Basis of Full Paper Review*	41	9	6	-	-	26
Refereed Conferences on the Basis of Abstract Review*	64	11	-	24	14	15
Sponsor Funded Projects	88	28	14	18	9	19
Books & Chapters of Books*	5	1	-	3	-	1
Patents	2	-	1	1	-	-
Doctoral Dissertations Advised	11	3	1	4	1	2
Master's Theses Advised	92	25	20	10	3	34
Graduate Research Papers Advised	52	1	18	-	-	33

*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 88% 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 Table 3.3 and Figure 3.1.

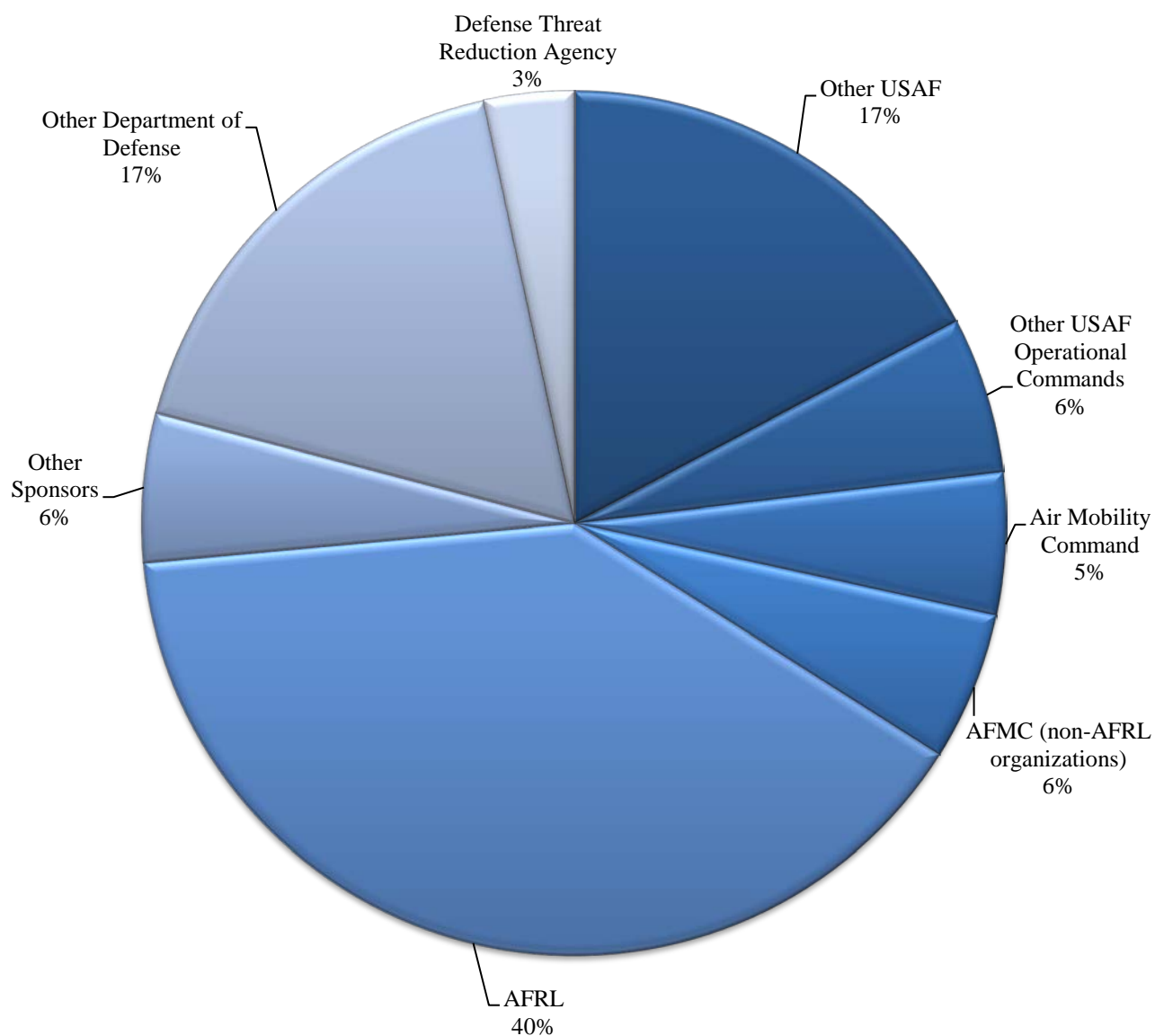


Figure 3.1 Sponsors of AFIT Theses, Dissertations, and Graduate Research Papers

Table 3.3 AFIT External Sponsorship by Organization

SPONSOR ORGANIZATION	PhD Dissertations	Master's Theses	Graduate Research Papers	Funded Projects
OFFICE OF THE SECRETARY OF THE AIR FORCE			2	4
HQ UNITED STATES AIR FORCE	1	3	2	2
AIR COMBAT COMMAND		1	1	
National Air and Space Intelligence Center		5	2	7
AIR EDUCATION AND TRAINING COMMAND				1
AIR FORCE MATERIEL COMMAND	1	11	1	6
Aeronautical Systems Center		5		3
Air Force Research Laboratory (AFRL)				
Air Force Office of Scientific Research (AFOSR)	7	18		38
Air Vehicles Directorate (RB)	4	16		12
Directed Energy Directorate (RD)		6		5
711 Human Performance Wing		17		1
Information Directorate (RI)		3		3
Materials & Manufacturing Directorate (RX)	1	9		7
Munitions Directorate (RW)		1	1	2
Propulsion Directorate (RZ)	2	21		5
Sensors Directorate (RY)	6	26	1	25
Space Vehicles Directorate (RV)	1	2		4
Air Force Global Logistics Support Center		2		2
Air Force Test Pilot School				3
AIR FORCE GLOBAL STRIKE COMMAND		1		
AIR MOBILITY COMMAND		6	13	
AIR FORCE SPACE COMMAND		3	3	1
Space and Missile Systems Center		5		3
USAF FIELD OPERATING AGENCIES/DIRECT REPORTING UNITS		10		
Air Force Technical Application Center				3
Air Force Medical Operations Agency			1	
Air Force Medical Support Agency				2
US Air Force Academy				1
OTHER DEPARTMENT OF DEFENSE	2	22	1	14
Defense Threat Reduction Agency	2	10		4
Defense Advanced Research Projects Agency				3
High Energy Laser Joint Technology Office	3	7		5
Joint Improvised Explosive Device Defeat Org				1
National Security Agency		3		6
Office of the Secretary of Defense		5	2	5
United States Army		1		4
US European Command			2	1
United States Navy		2		5
US Northern Command		1		
US Special Operations Command		3		
US Strategic Command		3		3
US Transportation Command		1	4	1
OTHER FEDERAL AGENCIES				
Department of Energy		5		2
Department of Homeland Security		3		2
National Aeronautics and Space Administration		1		1
National Science Foundation				3
NON-FEDERAL AGENCIES		11		4
Dayton Area Graduate Studies Institute				2
* TOTALS	30	249	36	206

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

3.4. OUTSIDE FUNDING FOR THE GRADUATE SCHOOL OF ENGINEERING AND MANAGEMENT

Many of the Graduate School of Engineering and Management's theses and research projects completed under faculty supervision (sponsored or unsponsored) are funded in part by other Air Force, DOD and government units and agencies. Often, this funding results from collaboration between faculty and thesis sponsors and occurs when the research project can be leveraged by the purchase of equipment or services not otherwise available. Tables 3.4 and 3.5, and Figure 3.3, summarize outside funding for FY11, and Figure 3.2 summarizes the past ten fiscal years of outside sponsored funding.

Table 3.4 FY11 External Funding & Research Expenditures for Academic Departments & Research Centers (\$1,000's)

Department	Newly Awarded Research Projects		Newly Awarded Education Projects		Total FY11 Newly Awarded Projects		Total FY11 Research Expenditures
	#	\$k	#	\$k	#	\$k	\$k
Mathematics & Statistics (ENC)	11	447	-	-	11	447	603
Electrical & Computer Eng (ENG)	70	9,882	2	1,058	72	10,940	10,893
Engineering Physics (ENP)	36	3,601	4	417	40	4,018	5,987
Research & Sponsored Programs (ENR)	2	39	1	34	3	73	31
Operational Sciences (ENS)	16	3,445	2	23	18	3,468	4,562
Systems and Eng Management (ENV)	14	956	1	267	15	1,223	1,684
Aeronautical & Astronautical Eng (ENY)	45	1,753	2	65	47	1,818	4,346
TOTAL	194	20,123	12	1,864	206	21,987	28,106

Center	#	\$k	#	\$k	#	\$k	\$k
Advanced Navigation Technology (ANT)	28	2,087	-	-	28	2,087	2,739
Center for Cyberspace Research (CCR)	12	5,935	2	1,058	14	6,993	4,572
Center for Directed Energy (CDE)	17	1,929	1	8	18	1,937	3,202
Center for Tech Intel Studies & Research (CTISR)	7	490	2	289	9	779	1,030
Center for Operational Analysis (COA)	17	3,482	2	23	19	3,505	4,645
TOTAL	81	13,923	7	1,378	88	15,301	16,188

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

Figure 3.2 New Award History FY02-FY11

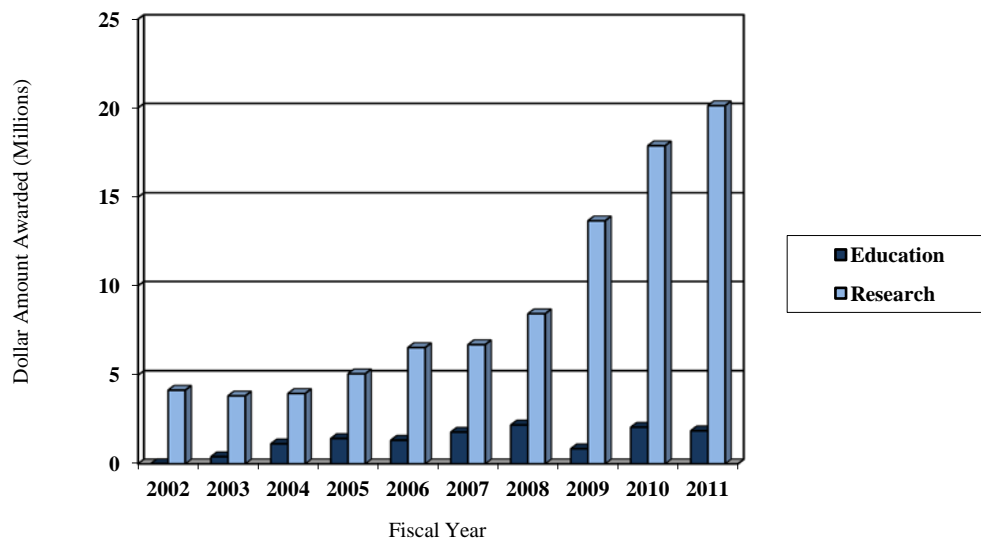
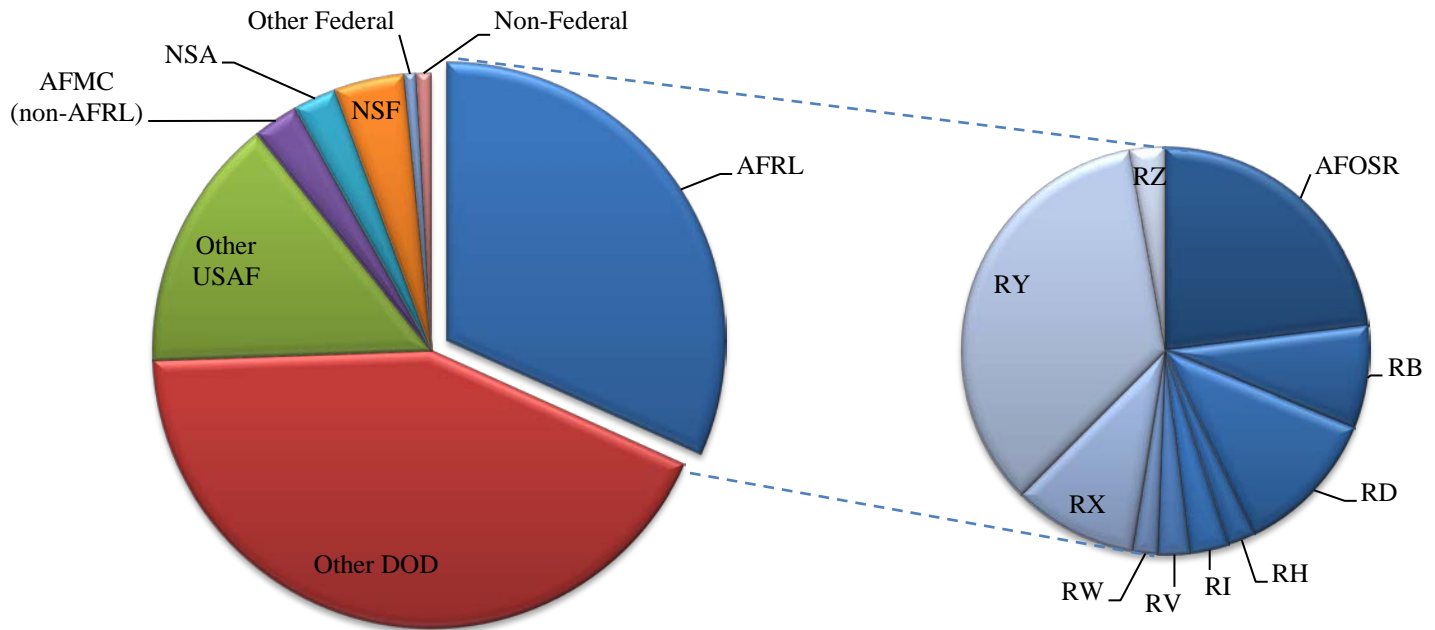


Figure 3.3 New FY11 Awards by Sponsor



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

Table 3.5 New FY11 Awards to Academic Departments & Research Centers by Sponsor

Dept.	AFRL \$k	AFMC (non- AFRL) \$k	Other USAF \$k	NSA \$k	Other DOD \$k	NSF \$k	Other Federal \$k	Non- Federal \$k	Total \$k
ENC	339	-	-	-	30	78	-	-	447
ENG	3,759	-	506	526	5,217	811	35	86	10,940
ENP	1,528	236	724	-	1,412	-	118	-	4,018
ENR	39	-	-	-	-	-	-	34	73
ENS	305	350	1,357	26	1,430	-	-	-	3,468
ENV	108	-	514	-	601	-	-	-	1,223
ENY	898	-	147	-	701	-	-	72	1,818
TOTAL	6,976	586	3,248	552	9,391	889	153	192	21,987

**Research
Center**

ANT	1,298	-	215	-	508	-	-	66	2,087
CCR	1,019	-	-	526	4,637	811	-	-	6,993
CDE	1,015	105	-	-	817	-	-	-	1,937
CTISR	151	-	613	-	15	-	-	-	779
COA	426	350	1,357	-	1,372	-	-	-	3,505
TOTAL	3,909	455	2,185	526	7,349	811	-	66	15,301

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

GRADUATE RESEARCH PAPERS

SPERRY, THARON, *Delphic Analytic Hierarchy Goal Programming Process (A Multiple Goal, Multiple Objective Decision Making Approach): Case Study Political Decision Making on the African Airlift Partnership*. AFIT/IMO/ENS/11-13. Faculty Advisor: Dr. James T. Moore. Sponsor: SAF/IA. [COA]

TERRY, KATRINA A., *Overcoming the Support Focus of the 17D Cyberspace Operations Career Field*. AFIT/ICW/ENG/11-12. Faculty Advisor: Dr. Robert F. Mills. Sponsor: SAF/A60. [CCR]

4.2. HEADQUARTERS UNITED STATES AIR FORCE

DOCTORAL DISSERTATIONS

BEDNAR, EARL M., *Identification and Classification of Player Types in Massive Multiplayer Online Games Using Avatar Behavior*. AFIT/DS/ENS/11S-01. Faculty Advisor: Dr. John O. Miller. Sponsor: HQ USAF/A9. [COA]

MASTER'S THESES

CHUA, MICHAEL E., *A Simulation of the ECSS Help Desk with the Erlang A Model*. AFIT/GCA/ENS/11-01. Faculty Advisor: Dr. Jeffrey A. Ogden. Sponsor: HQ USAF/A4. [COA]

GRADUATE RESEARCH PAPERS

KLEIV, DAIN O., *Examination of Air Force Crash Damaged or Disabled Aircraft Recovery Program Resourcing*. AFIT/ILS/ENS/11-05. Faculty Advisor: Dr. William A. Cunningham. Sponsor: HQ USAF/A4. [COA]

MORISSETTE, GREGORY A., *Developing a Predictive Model for Facility Repair Costs on United States Air Force Installations*. AFIT/ILS/ENV/11J-01. Faculty Advisor: Dr. Alfred E. Thal. Sponsor: HQ USAF/A7. [COA]

DEFENSE INTELLIGENCE AGENCY

MASTER'S THESES

JOYNER, GARDER J., *Measure of Effectiveness for JSTARS Ground Moving Target Indicator: A Value Focused Thinking Approach*. AFIT/OR/MS/ENS/11-11. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: DIA. [COA]

SPRINGSTON, JAMES J., *Determining the Value of Future Information*. AFIT/OR/MS/ENS/11-20. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: DIA. [COA]

4.3. AIR COMBAT COMMAND

MASTER'S THESES

DEGENHARDT, MARK A., *Metric Development for Continuous Process Improvement*. AFIT/OR/MS/ENS/11-04. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: ACC/A9. [COA]

GRADUATE RESEARCH PAPERS

GILBERT, RONALD E., *Strategic Implications of US Fighter Force Reductions: Air-to-Air Combat Modeling Using Lanchester Equations*. AFIT/IOA/ENS/11-01. Faculty Advisor: Dr. John O. Miller. Sponsor: ACC/433 WPS. [COA]

NATIONAL AIR AND SPACE INTELLIGENCE CENTER

MASTER'S THESES

GAGE, HARMON J.A., *Using Upper Layer Weights to Efficiently Construct and Train Feedforward Neural Networks Executing Backpropagation*. AFIT/OR/MS/ENS/11-06. Faculty Advisor: Dr. Kenneth W. Bauer. Sponsor: NASIC. [COA]

HARLEY, JACOB L., *Remote Quantification of Smokestack Total Effluent Mass Flow Rates Using Imaging Fourier-Transform Spectroscopy*. AFIT/GAP/ENP/11-M01. Faculty Advisor: Dr. Kevin C. Gross. Sponsor: NASIC. [CTISR]

MESSER, ADAM J., *Contextual Detection of Anomalies in Hyperspectral Images*. AFIT/OR/MS/ENS/11-15. Faculty Advisor: Dr. Kenneth W. Bauer. Sponsor: NASIC. [COA]

TURNQUIST, BROOKS R., *Fusion Schemes for Ensembles of Hyperspectral Anomaly Detection Algorithms*. AFIT/OR/MS/ENS/11-25. Faculty Advisor: Dr. Kenneth W. Bauer. Sponsor: NASIC. [COA]

VINCENT, ROBERT A., *Passive Ranging of Dynamic Rocket Plumes using Infrared and Visible Oxygen Attenuation*. AFIT/GAP/ENP/11-M11. Faculty Advisor: Lt Col Michael R. Hawks. Sponsor: NASIC. [CTISR]

GRADUATE RESEARCH PAPERS

KRILL, DENNIS J., *Re-integrating Influence and Cyber Operations*. AFIT/ICW/ENG/11-06. Faculty Advisor: Dr. Michael R. Grimaila. Sponsor: NASIC.

MARTINO, RICHARD A., *Leveraging Traditional Battle Damage Assessment Procedures to Measure Effects from a Computer Network Attack*. AFIT/ICW/ENG/11-08. Faculty Advisor: Dr. Robert F. Mills. Sponsor: NASIC. [CCR]

4.4. AIR EDUCATION AND TRAINING COMMAND

AIR FORCE INSTITUTE OF TECHNOLOGY

DOCTORAL DISSERTATIONS

CROSSLEY, BENJAMIN L., *Carbon Nanotube Field Emission Arrays*. AFIT/DCE/ENG/11-03. Faculty Advisor: Dr. Ronald A. Coutu, Jr. Sponsor: N/A.

DUBE, THOMAS E., *A Novel Malware Target Recognition Architecture for Enhanced Cyberspace Situation Awareness*. AFIT/DCE/ENG/11-07. Faculty Advisor: Dr. Richard A. Raines. Sponsor: N/A. [CCR]

FULLER, DANE F., *Phase History Decomposition for Efficient Scatterer Classification in SAR Imagery*. AFIT/DEE/ENG/11-09. Faculty Advisor: Maj Michael A. Saville. Sponsor: N/A.

MASTER'S THESES

BARKER, RICHARD T., *Satellite Detection by Doppler Shifted Signals off of the Air Force Space Surveillance System*. AFIT/GSS/ENY/11-M01. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: N/A.

BETTINGER, ROBERT A., *Spacecraft Demand Tasking and Skip Entry Responsive Maneuvers*. AFIT/GA/ENY/11-J03. Faculty Advisor: Dr. Jonathan T. Black. Sponsor: N/A.

BOHREN, JAMES S. & HOWARD, JOHN K., *Solar Warning Architecture for Manned Missions to Mars*. AFIT/GSE/ENV/11-J01DL. Faculty Advisor: Dr. John M. Colombi. Sponsor: N/A.

BRIGGS, GREGORY C., *Satellite Detection and Real-time Orbit Estimation with Commercial Telescopes*. AFIT/GA/ENY/11-J01. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: N/A.

CAGURANGAN, ERIC T., *Using an Intrusion Detection System to Protect Flight Control Software*. AFIT/GCS/ENG/11-01. Faculty Advisor: Lt Col Jeffrey W. Humphries. Sponsor: N/A. [CCR]

CAHOON, TROY L., *Airborne Wind Energy: Implementation and Design for the U.S. Air Force*. AFIT/GAE/ENY/11-M04. Faculty Advisor: Lt Col Frederick G. Harmon. Sponsor: N/A.

CALVER, TIMOTHY I., *An Empirical Analysis of the Cascade Secret Key Reconciliation Protocol for Quantum Key Distribution*. AFIT/GIR/ENV/11-S01. Faculty Advisor: Dr. Michael R. Grimaia. Sponsor: N/A.

CHONG, KENNETH Y., *Evaluation of Nanocomposites for Shielding Electromagnetic Interference*. AFIT/GAE/ENY/11-S01. Faculty Advisor: Dr. Shankar Mall. Sponsor: N/A.

CHRISTEL, BRADY T., *Two Dimensional Positioning and Heading Solution for Flying Vehicles Using a Line-Scanning Laser Radar (LADAR)*. AFIT/GE/ENG/11-04. Faculty Advisor: Lt Col Michael J. Stepaniak. Sponsor: N/A. [ANT]

CHUN, WOO-SUK, *Life Cycle Assessment of LEED vs. Conventionally Built Residential Units*. AFIT/GEM/ENV/11-M09. Faculty Advisor: Lt Col Peter P. Feng. Sponsor: N/A.

COLLINS, NATHAN S., *Investigation of User Position Error Prediction and Navigation Upload Management for the GPS Mission*. AFIT/GA/ENY/11-M01. Faculty Advisor: Dr. Jonathan T. Black. Sponsor: N/A.

ENRIGHT, THOMAS E., JR., *An Analysis of How Education, Age, Overseas Assignments, and Mavenism Impact Use of New Media Technology*. AFT/GIR/ENV/11-D01. Faculty Advisor: Dr. Alan R. Heminger. Sponsor: N/A.

EVEY, CHRISTOPHER J., *Analysis of Scaling in a Service-Oriented High Performance Computing (HPC) Environment*. AFIT/GSE/ENV/11-J03DL. Faculty Advisor: Dr. John M. Colombi. Sponsor: N/A.

DEBES, JOSHUA M., *Development of Infrastructure and Space Hardware for the ALICE CubeSat Mission*. AFIT/GSS/ENY/11-M02. Faculty Advisor: Dr. Jonathan T. Black. Sponsor: N/A.

DRISKELL, JAY W., *Low Earth Orbit Satellite Tracking Telescope Network: TELETRAKNET*. AFIT/GA/ENY/11-S01. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: N/A.

FREY, GREGORY R., *KAM Torus Frequency Generation from Two-Line Element Sets*. AFIT/GA/ENY/11-M04. Faculty Advisor: Dr. William E. Wiesel. Sponsor: N/A.

GANNON, TIMOTHY W., *Understanding Schedule Forecasting Shortfalls in Federal Design-Build Facility Procurement*. AFIT/GEM/ENV/11-M02. Faculty Advisor: Lt Col Peter P. Feng. Sponsor: N/A.

GOMES, KESIA G., *A Comparative Study Between U.S. and Brazilian Acquisition Regulations and Practices*. AFIT/LSCM/ENS/11-04. Faculty Advisor: Dr. Jeffrey A. Ogden. Sponsor: N/A. [COA]

HAGEN, LUKE J., *Effects of Air Drag and Lunar Third-Body Perturbations on Motion Near a Reference KAM Torus*. AFIT/GA/ENY/11-M06. Faculty Advisor: Dr. William E. Wiesel. Sponsor: N/A.

HAMILTON, NICOLAS S., *Long Term Quadrotor Stabilization*. AFIT/GE/ENG/11-13. Faculty Advisor: Lt Col Michael J. Stepaniak. Sponsor: N/A. [ANT]

HOCKING, HANNAH E., *TOF-SIMS for Rapid Nuclear Forensics Evaluation of Uranium Oxide Particles*. AFIT/GNE/ENP/11-M10. Faculty Advisor: Dr. Larry W. Burggarf. Sponsor: N/A.

HOMAN, JEREMY & SCHARCH, MATTHEWS, *Application and Validation of Concept Maturity Assessment Framework*. AFIT/GSE/ENV/11-M05. Faculty Advisor: Dr. David R. Jacques. Sponsor: N/A.

HOSKET, JONATHON S., *A Methodology Using Simulation Results for Test and Evaluation*. AFIT/OR/MS/11-09. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: N/A. [COA]

HOWARD, CARL N., *Initial Design and Development of an Extended Feature Colony I CubeSat Bus*. AFIT/GE/ENG/11-15. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: N/A. [ANT]

HOWARD, JOHN K., See BOHREN, JAMES S.

HUBER, KEVIN E., *Host-Based Systemic Network Obfuscation System for Windows*. AFIT/GCO/ENG/11-05. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: N/A. [CCR]

JENKS, REGINA M., *Comparison of Private and Public Sector Emergency Response Structure*. AFIT/GWM/ENP/11-J01. Faculty Advisor: LTC Eugene V. Sheely. Sponsor: N/A.

JOHNSON, TRAVIS R., *Application of Relational Contracting Methods to Federal Construction Projects*. AFIT/GEM/ENV/11-M03. Faculty Advisor: Lt Col Peter P. Feng. Sponsor: N/A.

KUHAR, BENJAMIN B., *Twitter Malware Collection System: An Automated URL Extraction and Examination Platform*. AFIT/GCO/ENG/11-07. Faculty Advisor: Dr. Rusty O. Baldwin. Sponsor: N/A. [CCR]

KURTZ, GARRETT M., *Notch Sensitivity of Fatigue Behavior of a Hi-Nicalon/SiC Ceramic Composite with an Oxidation Inhibited Matrix at 1200°C in Air and in Steam*. AFIT/GAE/ENY/11-M17. Faculty Advisor: Dr. Marina B. Ruggles-Wrenn. Sponsor: N/A.

KRUG, MICHELLE C., *Insider Threat Detection Using Microsoft Event Viewer Log Files*. AFIT/GCO/ENG/10-19. Faculty Advisor: Dr. Rusty O. Baldwin. Sponsor: N/A. [CCR]

LESAR, MARK B., *Design and Development of a Dynamic Two-Way Time Transfer Experiment Utilizing a 3U CubeSat*. AFIT/GA/ENY/11-M11. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: N/A.

LICKLIDER, CHRISTY A.R., *A Meta-Analysis of the Antecedents of Voluntary Turnover in Studies Involving Active Duty Military Member Populations*. AFIT/GEM/ENS/11-01. Faculty Advisor: Lt Col Sharon G. Heilmann. Sponsor: N/A. [COA]

LITTLE, SAMUEL A., SCHREINER, ROBERT J., & SPENCER, GUY T., *Capability Based Assessment for the Chromotomographic Spectrometer Flight Experiment*. AFIT/ISE/ENV/11-J03. Faculty Advisor: Dr. Jonathan T. Black. Sponsor: N/A.

LUSTIC, KEVIN C., *Performance Analysis and Optimization of the Winnow Secret Key Reconciliation Protocol*. AFIT/GCO/ENG/11-08. Faculty Advisor: Lt Col Jeffrey W. Humphries. Sponsor: N/A. [CCR]

MASSMAN, JENNIFER L., *Understanding the Influence of Turbulence in Imaging Fourier-Transform Spectrometry of Smokestack Plumes*. AFIT/GAP/ENP/11-M05. Faculty Advisor: Dr. Kevin C. Gross. Sponsor: N/A. [CTISR]

MILLER, APRIL D., *A Comparison in the Accuracy of Mapping Nuclear Fallout Patterns using HPAC, HYSPLIT, DELFIC FPT and an AFIT FORTRAN95 Fallout Deposition Code*. AFIT/GNE/ENP/11-M16. Faculty Advisor: Dr. Steven T. Fiorino. Sponsor: N/A. [CDE]

MILLER, JOSHUA T., *Immediate and Delayed Drug Therapy Effects on Low Dose Sarin Exposed Mice Myocardial Performance*. AFIT/GWM/ENP/11-M03. Faculty Advisor: Dr. Charles A. Bleckmann. Sponsor: N/A.

MONFETTE, MONICA L., *Impact of Snow Removal Operations on Thermoplastic Pavement Markings*. AFIT/GEM/ENV/11-M08. Faculty Advisor: Lt Col William E. Sitzabee. Sponsor: N/A.

MORAN, GREGORY M., *Augmentation of a Ground-Based Satellite-Tracking Telescope System*. AFIT/GAE/ENY/11-M13. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: N/A.

NELSON, JEFFREY S., *Combating Biological Terrorism from Imported Food*. AFIT/GWM/ENP/11-M04. Faculty Advisor: Dr. Charles A. Bleckmann. Sponsor: N/A.

NIEDERHAUSER, JASON D., *Design and Characterization of a Space Based Chromotomographic Hyperspectral Imaging Experiment*. AFIT/GA/ENY/11-J02. Faculty Advisor: Dr. Jonathan T. Black. Sponsor: N/A.

NIELSEN, JASON R., *Evaluating Information Assurance Control Effectiveness on an Air Force Supervisory Control and Data Acquisition (SCADA) System*. AFIT/GCO/ENG/11-10. Faculty Advisor: Maj Jeffrey M. Hemmes. Sponsor: N/A. [CCR]

OSTLER, RYAN T., *Defensive Cyber Battle Damage Assessment through Attack Methodology Modeling*. AFIT/GCO/ENG/11-11. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: N/A. [CCR]

OWEN, TOMAS G., *Evaluation of the Effectiveness of Various Protection Mechanisms against Smart Card-Borne Threats*. AFIT/GCO/ENG/11-12. Faculty Advisor: Lt Col Jeffrey W. Humphries. Sponsor: N/A. [CCR]

ROYALS, JASON P., *Avatars, Media Usage, and the Linkages to E-learning Effectiveness*. AFIT/GIR/ENV/11-M05. Faculty Advisor: Lt Col Gregory M. Schechtman. Sponsor: N/A.

SCHARCH, MATTHEWS, See HOMAN, JEREMY.

SCHREINER, ROBERT J., See LITTLE, SAMUEL A.

SCOTT, JEFFREY B., *Automated Analysis of ARM Binaries Using the Low-Level Virtual Machine Compiler Framework*. AFIT/GCO/ENG/11-14. Faculty Advisor: Dr. Rusty O. Baldwin. Sponsor: N/A. [CCR]

SPENCER, GUY T., See LITTLE, SAMUEL A.

STANGE, JACOB M., *Authentication Theft: An Attack on .NET Smart Cards*. AFIT/GCO/ENG/11-15. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: N/A. [CCR]

STEVENSON, ALEXANDER W., *Improving the Efficiency of Photon Collection by Compton Rescue*. AFIT/GAP/ENP/11-M10. Faculty Advisor: Lt Col Christopher S. Williams. Sponsor: N/A.

SUTARA, STEPHEN J., *Experimental Investigation into the Radar Cross Section of the Gridded Square Trihedral*. AFIT/GE/ENG/11-38. Faculty Advisor: Maj Michael A. Saville. Sponsor: N/A.

TEMPELIS, ANDREAS X., *Bistatic 3D Electromagnetic Scattering from a Right-Angle Dihedral at Arbitrary Orientation and Position*. AFIT/GE/ENG/11-39. Faculty Advisor: Dr. Julie A. Jackson. Sponsor: N/A.

WAGONER, LAUREN M., *Detecting Man-in-the-Middle Attacks against Transport Layer Security Connections with Timing Analysis*. AFIT/GCO/ENG/11-16. Faculty Advisor: Lt Col Jeffrey W. Humphries. Sponsor: N/A. [CCR]

YATES, MAX W., *Stochastic Orbit Prediction using KAM Tori*. AFIT/GA/ENY/11-M15. Faculty Advisor: Dr. William E. Wiesel. Sponsor: N/A.

GRADUATE RESEARCH PAPERS

BARCOMB, KRIS E., *Taking the High Ground: A Case for Department of Defense Application of Public Cloud Computing*. AFIT/ICW/ENG/11-01. Faculty Advisor: Dr. Robert F. Mills. Sponsor: N/A. [CCR]

FRAMPTON, JONATHAN J., *Achieving National Unity of Effort in Cyber*. AFIT/ICW/ENG/11-04. Faculty Advisor: Dr. Michael R. Grimaila. Sponsor: N/A. [CCR]

GHAI, RACHEL, *A Taxonomy for Insourcing in the Aerospace Industry*. AFIT/ILS/ENS/11-12. Faculty Advisor: Lt Col Timothy J. Pettit. Sponsor: N/A. [COA]

HAMMOND, CHRISTOPHER B., *Integration of Cyberspace Operations and Conventional Kinetic Air Operations*. AFIT/ICW/ENG/11-05. Faculty Advisor: Lt Col David J. Robinson. Sponsor: N/A. [CCR]

LAROSE, AARON J., *Utilization of Decision Analysis for Service Member Retirement Options*. AFIT/IOA/ENS/11-02. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: N/A. [COA]

LLANTADA, RONALD, *The Effects of Employing HVM on C-130 Aircraft at WR-ALC to Aircraft Availability*. AFIT/ILS/ENS/11-06. Faculty Advisor: Dr. William A. Cunningham. Sponsor: N/A. [COA]

MAYER, BRIAN P., *Contingency Response Groups: An Analysis of Maintenance Training*. AFIT/IMO/ENS/11-09. Faculty Advisor: Dr. William A. Cunningham. Sponsor: N/A. [COA]

MCCALLIE, DONALD L., *Exploring Potential ADS-B Vulnerabilities in the FAA's NextGen Air Transportation System*. AFIT/ICW/ENG/11-09. Faculty Advisor: Capt Jonathan W. Butts. Sponsor: N/A. [CCR]

MUSE, YIRA Y., *Use of Informal Networks to Resolve Logistics-related Issues in Humanitarian Assistance/Disaster Response*. AFIT/ILS/ENS/11-09. Faculty Advisor: Lt Col Sharon G. Heilmann. Sponsor: N/A. [COA]

NELSON, ALEXANDER D., *Patching the Wetware: Addressing the Human Factor in Information Security*. AFIT/ENG/ICW/011-11. Faculty Advisor: Dr. Robert F. Mills. Sponsor: N/A. [CCR]

UNDERWOOD, KENNETH D., *Minimizing the Risks of Diminishing Manufacturing Sources and Material Shortages: Evaluating Electronic Avionics Lifecycle Sustainment Strategies*. AFIT/ILS/ENS/11-10. Faculty Advisor: Dr. Jeffrey A. Ogden. Sponsor: N/A. [COA]

4.5. AIR FORCE MATERIEL COMMAND

MASTER'S THESES

GKOUTOULOUDIS, MICHAIL, *Smoking in the United States Air Force: Trends, Most Prevalent Diseases and Their Association with Cost*. AFIT/GCA/ENV/11-S02. Faculty Advisor: Lt Col Dirk P. Yamamoto. Sponsor: AFMC.

HACKLEMAN, ANDREW S., *Nuclear Enterprise Performance Measurement*. AFIT/LSCM/ENS/11-05. Faculty Advisor: Dr. Alan W. Johnson. Sponsor: AFMC/OV. [COA]

LEGUIZA, FRANCISCO E., *By Product Synergy Analysis*. AFIT/LSCM/ENS/11-08. Faculty Advisor: Lt Col Timothy J. Pettit. Sponsor: HQ AFMC. [COA]

MOON, STEPHEN M., *RVUMS Antenna Modeling and Simulation for Identification and Mitigation of Ring-down*. AFIT/GE/ENG/11-29. Faculty Advisor: Dr. Peter J. Collins. Sponsor: AFMC/781 TS.

MURPHY, RACHEAL G., *A Primary Care Workload Production Model for Estimating Relative Value Unit Output*. AFIT/GFA/ENV/11-M03. Faculty Advisor: Dr. Alfred E. Thal. Sponsor: 88 MDSS.

PRUITT, JAMES L., *Decision Analysis and Validation of Value Focused Thinking Decision Models Using Multivariate Analysis Techniques*. AFIT/OR/MS/ENS/11-17. Faculty Advisor: Dr. Kenneth W. Bauer. Sponsor: AFMC/A9. [COA]

USRY, SIDNEY J., *Using Specific Excess Power Estimation in Flight Test Planning to Improve Safety and Efficiency*. AFIT/GAE/ENY/11-M31. Faculty Advisor: Lt Col Richard E. Huffman. Sponsor: 412 OG.

TALAFUSE, THOMAS P., *Empirical Characterization of Ballistic Impact Flash*. AFIT/OR/MS/ENS/11-23. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: 46 TG. [COA]

GRADUATE RESEARCH PAPERS

COOLEY, HEATHER D., *C-130 Programmed Depot Maintenance Processes*. AFIT/ILS/ENS/11J-02. Faculty Advisor: Dr. Alan W. Johnson. Sponsor: HQ AFMC. [COA]

AIR FORCE NUCLEAR WEAPONS CENTER

DOCTORAL DISSERTATIONS

GOLDBERG, JACOB B., *An Analytical Model of Nanometer Scale Viscoelastic Properties of Polymer Surfaces Measured Using an Atomic Force Microscope*. AFIT/DAM/ENC/11-03. Faculty Advisor: Dr. William P. Baker. Sponsor: AFNWC.

MASTER'S THESES

HURST, ALEXIS X., *Modeling of Bacillus Spores: Inactivation and Outgrowth*. AFIT/GAM/ENC/11-01. Faculty Advisor: Dr. William P. Baker. Sponsor: AFNWC & DTRA.

AIR FORCE SEEK EAGLE OFFICE

MASTER'S THESES

COLEY, CHRISTOPHER J., *An Investigation of Cavity Resonance and its Relationship to Store Force and Moment Loading*. AFIT/GAE/ENY/11-M05. Faculty Advisor: Maj Andrew J. Lofthouse. Sponsor: AFSEO.

MASSETT, ANTHONY P., *AIM-9 Control Surface Effects on Subsonic LCO Analysis for F-16 Store Configuration Clearance*. AFIT/GAE/ENY/11-M19. Faculty Advisor: Dr. Donald L. Kunz. Sponsor: AFSEO.

AERONAUTICAL SYSTEMS CENTER

MASTER'S THESES

BOEHMKE, BRADLEY C., *Model for Identifying Cost Savings by Synchronizing the E-4B NAO C Replacement and Presidential Aircraft Recapitalization Programs*. AFIT/GCA/ENV/11-J01. Faculty Advisor: Dr. Adedeji B. Badiru. Sponsor: ASC.

HAASE, CASEY L., *Tailoring the Statistical Experimental Design Process for LVC Experiments*. AFIT/GOR/ENS/11-07. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: ASC. [COA]

MCGROGAN, JASON D. & SCHNEIDER, MICHAEL F., *Architecture Based Workload Analysis of UAS Multi-Aircraft Control: Implications of Implementation on MQ-1B Predator*. AFIT/GSE/ENV/11-M02. Faculty Advisor: Dr. John M. Colombi. Sponsor: ASC.

MORIN, ERIC C., *The Application of Cost Estimation to the Compatibility Assessment Method*. AFIT/GFA/ENV/11-M02. Faculty Advisor: Dr. Charles A. Bleckmann. Sponsor: ASC.

SCHNEIDER, MICHAEL F., See MCGROGAN, JASON D.

YSEBAERT, STEPHANIE C., *An Analytical Approach to Low Observable Maintenance Practices using Simulation and Marginal Analysis*. AFIT/OR/MS/ENS/11-19. Faculty Advisor: Dr. Alan W. Johnson. Sponsor: ASC. [COA]

AFRL: AIR FORCE OFFICE OF SCIENTIFIC RESEARCH

DOCTORAL DISSERTATIONS

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

ELLIS, TROY R., *Shack-Hartmann and Interferometric Hybrid Wavefront Sensor*. AFIT/DEO/ENG/11-01. Faculty Advisor: Maj Jason D. Schmidt. Sponsor: AFOSR.

FADUL, JOSE E., *Using Reputation Based Trust to Overcome Malfunctions and Malicious Failures in Electric Power Protection Systems*. AFIT/DEE/ENG/11-08. Faculty Advisor: Dr. Kenneth M. Hopkinson. Sponsor: AFOSR. [ANT]

STULTS, JOSHUA A., *Nonintrusive Microwave Diagnostics of Collisional Plasmas in Hall Thrusters and Dielectric Barrier Discharges*. AFIT/DS/ENY/11-15. Faculty Advisor: Dr. Mark F. Reeder. Sponsor: AFOSR.

TELLEZ, JASON A., *Integrated Approach to Free Space Optical Communications in Strong Turbulence*. AFIT/DEE/ENG/11-11. Faculty Advisor: Maj Jason D. Schmidt. Sponsor: AFOSR.

WEI, JEAN W., *Optical and Electrical Characterization Melt-Grown Bulk InGaAs and InAsP*. AFIT/DS/ENP/11-M02. Faculty Advisor: Dr. Yung K. Yeo. Sponsor: AFOSR.

WHEELER, DANIEL J., *Modeling Self-Referencing Interferometers with Extended Beacons and Strong Turbulence*. AFIT/DEO/ENG/11-12. Faculty Advisor: Maj Jason D. Schmidt. Sponsor: AFOSR.

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BARES, DAVID C., *Satellite Security: Obfuscating Command Link Messages*. AFIT/GCO/ENG/11-01. Faculty Advisor: Maj Eric M. Trias. Sponsor: AFOSR. [CCR]

BENHASSEN, FIRAS, *Time Resolved Filtered Rayleigh Scattering Measurement of a Centrifugally Loaded Buoyant Jet*. AFIT/GAE/ENY/11-M01. Faculty Advisor: Dr. Marc D. Polanka. Sponsor: AFOSR.

BOCHERT, JOHN R., *Software and Critical Technology Protection Against Side Channel Analysis through Dynamic Hardware Obfuscation*. AFIT/GCE/ENG/11-01. Faculty Advisor: Dr. Yong C. Kim. Sponsor: AFOSR.

COERBELL, MARLON, *Creating a Network Model for the Integration of Dynamic and Static Supervisory Control and Data Acquisition (SCADA) Test Environment*. AFIT/GCO/ENG/11-02. Faculty Advisor: Dr. Kenneth M. Hopkinson. Sponsor: AFOSR.

DELEON, NATHANIAL E., *Manufacturing and Evaluation of a Biologically Inspired Engineered MAV Wing Compared to the Manduca Sexta Wing Under Simulated Flapping Conditions*. AFIT/GAE/ENY/11-M07. Faculty Advisor: Dr. Anthony N. Palazotto. Sponsor: AFOSR & AFRL/RB.

DUNCAN, MARK C., *Trust Management and Security in Satellite Telecommand Processing*. AFIT/GCO/ENG/11-03. Faculty Advisor: Dr. Kenneth M. Hopkinson. Sponsor: AFOSR. [ANT]

FALKINBURG, JEFFREY L., *Dynamic Polymorphic Reconfiguration to Effectively “CLOAK” a Circuit’s Function*. AFIT/GCE/ENG/11-03. Faculty Advisor: Dr. Yong C. Kim. Sponsor: AFOSR.

GETZ, THOMAS B., *Radiation Induced Fault Detection, Diagnosis, and Characterization of Field Programmable Gate Arrays*. AFIT/GE/ENG/11-12. Faculty Advisor: Dr. Yong C. Kim. Sponsor: AFOSR.

GREVE, GABRIEL H., *Network Security Toolkit Including Heuristic Solutions for Trust System Placement and Network Obfuscation*. AFIT/GCS/ENG/10-08. Faculty Advisor: Dr. Kenneth M. Hopkinson. Sponsor: AFOSR. [ANT]

HAUGHT, JAMES D., *Adaptive Quality of Service Engine with Dynamic Queue Control*. AFIT/GCC/ENG/11-03. Faculty Advisor: Dr. Kenneth M. Hopkinson. Sponsor: AFOSR.

JOHNSON, JEREMIAH D., *Polarimetric Enhancements to Electro-Optical Aided Navigation Techniques*. AFIT/GE/ENG/11-19. Faculty Advisor: Lt Col Jeremy C. Holtgrave. Sponsor: AFOSR. [ANT]

KO, HYUNCHUL, *Combinational Circuit Obfuscation through Power Signature Manipulation*. AFIT/GCS/ENG/11-05. Faculty Advisor: Dr. Yong C. Kim. Sponsor: AFOSR.

MCGEE, MILES E., *Critical Information Technology on FPGAs through Unique Device Specific Keys*. AFIT/GCE/ENG/11-10. Faculty Advisor: Dr. Yong C. Kim. Sponsor: AFOSR.

SENEY, STEVEN D., JR., *Increasing the Performance of a Sliding Discharge Actuator through the Application of Multiple Potentials*. AFIT/GA/GAE/ENY/11-S01. Faculty Advisor: Lt Col Richard E. Huffman. Sponsor: AFOSR.

SUMMERS, SARAH E., *Improved Collision Modeling for Direct Simulation Monte Carlo Methods*. AFIT/GAE/ENY/11-M29. Faculty Advisor: Dr. Robert B. Greendyke. Sponsor: AFOSR.

TUBBS, TRAVIS B., *Biological Investigation of the Stimulated Flapping Motions of the Moth, Manduca Sexta*. AFIT/GSS/ENY/11-M04. Faculty Advisor: Dr. Anthony N. Palazotto. Sponsor: AFOSR & AFRL/RB.

WAHLQUIST, JOSEPH A., *Effects of Prior Aging at 274⁰C in Argon on Inelastic Deformation Behavior of PMR-15 Polymer at 288⁰C: Experiment and Modeling*. AFIT/GAE/ENY/10-D03. Faculty Advisor: Dr. Marina B. Ruggles-Wrenn. Sponsor: AFOSR.

WALKER, ARIELLA C., *Positron Annihilation Ratio Spectroscopy Study of Electric Fields Applied to Positronium at Material Interfaces*. AFIT/GNE/ENP/11-M19. Faculty Advisor: Dr. Larry W. Burggarf. Sponsor: AFOSR.

AFRL: AIR VEHICLES DIRECTORATE

DOCTORAL DISSERTATIONS

ANDERSON, MICHAEL L., *Design and Control of Flapping Wing Micro Air Vehicles*. AFIT/DS/ENY/11-12. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: AFRL/RB.

CALLAWAY, DAVID W., *Photogrammetric Measurement of Recession Rates of Low Temperature Ablators Subjected to High Speed Flow*. AFIT/DS/ENY/11-03. Faculty Advisor: Dr. Mark F. Reeder. Sponsor: AFRL/RB.

REYNOLDS, TINA H., *Flow Control Application on a Submerged Inlet Characterized by Three-Component LDV*. AFIT/DS/ENY/10-D03. Faculty Advisor: Dr. Mark F. Reeder. Sponsor: AFRL/RB.

ROSS, STEVEN M., *Stochastic Real-time Optimal Control: A Pseudospectral Approach for Bearing-Only Trajectory Optimization*. AFIT/DS/ENY/11-24. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: AFRL/RB.

MASTER'S THESES

BOIRE, JEREMY P., *Autonomous Routing of Unmanned Aerial Vehicle (UAV) Relays to Mimic Optimal Trajectories in Real Time*. AFIT/GSE/ENV/11-M03. Faculty Advisor: Dr. David R. Jacques. Sponsor: AFRL/RB.

CHOI, YOUNGDONG, *Characterizing Cyclostationary Features of Digital Modulated Signals with Empirical Measurements using Spectral Correlation Function*. AFIT/GAE/ENY/11-J06. Faculty Advisor: Dr. Meir N. Pachter. Sponsor: AFRL/RB.

COTTLE, ANDREW E., *Initial Operational Validation of an Unmanned Aerial Vehicle Mission Simulation Model*. AFIT/GSE/ENV/11-M08. Faculty Advisor: Dr. David R. Jacques. Sponsor: AFRL/RB.

DAWSON, DAVID S., *Repeatable Manufacture of Wings for Flapping Wing Micro Air Vehicles using Microelectromechanical System (MEMS) Fabrication Techniques*. AFIT/GAE/ENY/11-M06. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: AFRL/RB.

DELEON, NATHANIAL E., *Manufacturing and Evaluation of a Biologically Inspired Engineered MAV Wing Compared to the Manduca Sexta Wing Under Simulated Flapping Conditions*. AFIT/GAE/ENY/11-M07. Faculty Advisor: Dr. Anthony N. Palazotto. Sponsor: AFOSR & AFRL/RB.

JELIC, RENATO, *Study of Varying Boundary Layer Height on Turret Flow Structures*. AFIT/GAE/ENY/11-J01. Faculty Advisor: Dr. Robert B. Greendyke. Sponsor: AFRL/RB.

KASZYNSKI, ALEXANDER A., *X-HALE: The Development of a Research Platform for the Validation of Nonlinear Aeroelastic Codes*. AFIT/GAE/ENY/11-M15. Faculty Advisor: Lt Col Christopher M. Shearer. Sponsor: AFRL/RB

KASZYNSKI, BROOKE E., *Simulations for the Test Flight of an Experimental HALE Aircraft*. AFIT/GAE/ENY/11-J02. Faculty Advisor: Lt Col Christopher M. Shearer. Sponsor: AFRL/RB.

KIM, TAE H., *Follower-Force Experiments with Geometric Non-Linear Coupling for Analytical Validation*. AFIT/GA/ENY/11-M10. Faculty Advisor: Dr. Eric D. Swenson. Sponsor: AFRL/RB.

KRUSE, ADAM J., *Hypersonic High Angle of Attack Flow Effects*. AFIT/GAE/ENY/11-M16. Faculty Advisor: Dr. Robert B. Greendyke. Sponsor: AFRL/RB.

LAMBERT, DANIEL B., *Composite Aircraft Life Cycle Cost Estimating Model*. AFIT/GCA/ENV/11-M02. Faculty Advisor: Dr. Som R. Soni. Sponsor: AFRL/RB.

LOZANO, BENIAH D., *Improving Unmanned Aircraft Persistence by Enhancing Endurance and Effective Surveillance Using Design of Experiments and Regression Analysis*. AFIT/GSE/ENV/11-M09. Faculty Advisor: Dr. John M. Colombi. Sponsor: AFRL/RB.

PAUL, MICHAEL C., *Experimental Measurements of Store Separation Using Dry Ice Models in A Subsonic Flow*. AFIT/GAE/ENV/11-M23. Faculty Advisor: Dr. Mark F. Reeder. Sponsor: AFRL/RB.

SINNOKRAK, NICHOLAS A., *Process for Refining and Validating a Finite Element Model of an Experimental High-Altitude, Long-Endurance (HALE) Aircraft*. AFIT/GAE/ENV/11-J04. Faculty Advisor: Lt Col Christopher M. Shearer. Sponsor: AFRL/RB.

SLADEK, NATHANAEL J., *Flapping Wing Micro Air Vehicle Wing Manufacture and Force Testing*. AFIT/GA/ENV/11-M14. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: AFRL/RB.

TUBBS, TRAVIS B., *Biological Investigation of the Stimulated Flapping Motions of the Moth, Manduca Sexta*. AFIT/GSS/ENV/11-M04. Faculty Advisor: Dr. Anthony N. Palazotto. Sponsor: AFOSR & AFRL/RB.

AFRL: DIRECTED ENERGY DIRECTORATE

MASTER'S THESES

AMIRAULT, PHILIP & NUHU, ABDUL-RAZAK, *Systems Engineering Plan for High Powered Microwave System Development*. AFIT/GSE/ENV/10-D01DL. Faculty Advisor: Dr. David R. Jacques. Sponsor: AFRL/RD.

DENNISON, JEFFERY S., *Simulating the Effects of an Extended Source on the Shack-Hartmann Wavefront Sensor through Turbulence*. AFIT/GE/ENG/11-08. Faculty Advisor: Maj Jason D. Schmidt. Sponsor: AFRL/RD.

ENGELSON, KURTIS G., *Three Channel Polarimetric Based Data Deconvolution*. AFIT/GE/ENG/11-10. Faculty Advisor: Dr. Stephen C. Cain. Sponsor: AFRL/RD.

MACMANUS, QUENTIN D., *Blind Deconvolution Method of Image Deblurring Using Convergence of Variance*. AFIT/GE/ENG/11-26. Faculty Advisor: Dr. Richard K. Martin. Sponsor: AFRL/RD.

MCGUIGAN, RUSSEL J., *Effect of Coudé Pupil Rotation on Sodium Laser Beacon Perspective Elongation*. AFIT/GE/ENG/11-28. Faculty Advisor: Maj Jason D. Schmidt. Sponsor: AFRL/RD.

MELIN, MEGAN P., *Modeling and Analysis of High Energy Laser Weapon System Performance in Varying Atmospheric Conditions*. AFIT/OR/MS/ENS/11-27. Faculty Advisor: Dr. John O. Miller. Sponsor: AFRL/RD. [COA & CDE]

NUHU, ABDUL-RAZAK, See AMIRAULT, PHILIP.

AFRL: 711th HUMAN PERFORMANCE WING/RH

MASTER'S THESES

CLIMER, JONATHON R., *Overcoming Pose Limitations of a Skin-Cued Histograms of Oriented Gradients Dismount Detector through Contextual Use of Skin Islands and Multiple Support Vector Machines*. AFIT/GE/ENG/11-05. Faculty Advisor: Maj Michael J. Mendenhall. Sponsor: 711 HPW/RH. [ANT]

COOPER, CHRISTOPHER M., *A Framework for the Management of Simulated Behavior Performance*. AFIT/GCE/ENG/11-02. Faculty Advisor: Lt Col Brett J. Borghetti. Sponsor: 711 HPW/RH. [ANT]

HICKS, JOSEPH L., *New Media Analysis: The Effects of Peer Influence and Personality Characteristics through the Stages of Trial, Adoption, and Continued Use of Video Sharing Websites*. AFIT/GIR/ENV/11-M02. Faculty Advisor: Dr. Michael R. Grimaila. Sponsor: 711 HPW/RH.

HO, DAVID M., *Personality and Social Influence Characteristic Affects on Ease of Use and Peer Influence of New Media Users Over Time*. AFIT/GRD/ENV/11-M01. Faculty Advisor: Dr. Alfred E. Thal. Sponsor: 711 HPW/RH.

HOLDER, CRAIG A., *Development of Optimized Guidelines for Therapeutic Strategies for Organophosphate Poisoning*. AFIT/GIH/ENV/11-M02. Faculty Advisor: Dr. Michael L. Shelley. Sponsor: 711 HPW/RH.

KOCH, BRADLEY M., *A Multispectral Bidirectional Reflectance Distribution Function Study of Human Skin for Improved Dismount Detection*. AFIT/GE/ENG/11-22. Faculty Advisor: Maj Michael J. Mendenhall. Sponsor: 711 HPW/RH. [ANT]

MAIER, MATTHEW J., *Estimating Anthropometric Marker Locations from 3-D LADAR Point Clouds*. AFIT/GE/ENG/11-27. Faculty Advisor: Maj Michael J. Mendenhall. Sponsor: 711 HPW/RH. [ANT]

MILLER, JAMES L., *An Architecture for Improving Timeliness and Relevance of Cyber Incident Notifications*. AFIT/GCO/ENG/11-09. Faculty Advisor: Dr. Robert F. Mills. Sponsor: 711 HPW/RH. [CCR]

PAULI, AARON, *Leadership Criteria under Maximum Performance Conditions*. AFIT/GRD/ENV/11-M02. Faculty Advisor: Lt Col Joseph R. Wirthlin. Sponsor: 711 HPW/RH.

PETERSON, CHRISTY L., *Measuring the Utility of a Cyber Incident Mission Impact Assessment (CIMIA) Process for Mission Assurance*. AFIT/GIR/ENV/11-M04. Faculty Advisor: Dr. Michael R. Grimaila. Sponsor: 711 HPW/RH.

RICHEY, MARK B., *The Positive Impact of Negative Feedback*. AFIT/GRD/ENV/11-M03. Faculty Advisor: Lt Col John J. Elshaw. Sponsor: 711 HPW/RH.

SIMMONS, DAVID B., *Integration of a Worldwide Atmospheric Based Model with a Live Virtual Constructive Simulation Environment*. AFIT/GAP/ENP/11-M09. Faculty Advisor: Dr. Steven T. Fiorino. Sponsor: 711 HPW/RH. [CDE]

AFRL: 711th HUMAN PERFORMANCE WING/USAFSAM

MASTER'S THESES

BLACK, JON E., *Evaluation of XMX/2L-MIL Virtual Impactor Performance and Capture and Retention of Aerosol Particles in Two Different Collection Media*. AFIT/GIH/ENV/11-M01. Faculty Advisor: Lt Col Dirk P. Yamamoto. Sponsor: 711 HPW/USAFSAM.

BROWNHEIM, SITAO V., *Characterization and In Vitro Toxicity of Copper Nanoparticles (Cu-NPs) in Murine Neuroblastoma (N2A) Cells*. AFIT/GES/ENV/11-M01. Faculty Advisor: Dr. Charles A. Bleckmann. Sponsor: 711 HPW/USAFSAM.

RINKER, JOHN P., *Retrospective Geospatial Modeling of PM10 Exposures from Open Burning at Joint Base Balad, Iraq*. AFIT/GIH/ENV/11-M03. Faculty Advisor: Lt Col Dirk P. Yamamoto. Sponsor: 711 HPW/USAFSAM.

WOSKOV, STEPHEN M., *Improving the Relevance of Cyber Incident Notification for Mission Assurance*. AFIT/GIR/ENV/11-M06. Faculty Advisor: Dr. Michael R. Grimaila. Sponsor: 711 HPW/USAFSAM.

YON, RICHARD E., *Characterization of Graphite Composite Material Particulates from USAF Aircraft Maintenance Operations*. AFIT/GIH/ENV/11-M04. Faculty Advisor: Lt Col Dirk P. Yamamoto. Sponsor: 711 HPW/USAFSAM.

AFRL: INFORMATION DIRECTORATE

MASTER'S THESES

CASTLE, BRETT C., *Memristive Properties of Thin Film Cuprous Oxide*. AFIT/GMS/ENP/11-M01. Faculty Advisor: Dr. Alex Li. Sponsor: AFRL/RI.

JI, JENNY W., *Holistic Network Defense: Fusing Host and Network Features for Attack Classification*. AFIT/GE/ENG/11-18. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: AFRL/RI. [ANT]

SCHOCKLING, MINDY K., *Zero-Knowledge Authentication in Mobile Ad Hoc Networks*. AFIT/GCO/ENG/11-13. Faculty Advisor: Dr. Rusty O. Baldwin. Sponsor: AFRL/RI. [CCR]

AFRL: MATERIALS AND MANUFACTURING DIRECTORATE

DOCTORAL DISSERTATIONS

ARMANI, CLINTON J., *Creep Performance of Oxide Ceramic Fiber Materials at Elevated Temperature in Air and in Steam*. AFIT/DS/ENY/11-02. Faculty Advisor: Dr. Marina B. Ruggles-Wrenn. Sponsor: AFRL/RX.

MASTER'S THESES

BECKETT, EDWARD & SHIN, HYOUNGJIN, *A Systems Architecture and Advanced Sensors Application for Real-time Aircraft Structural Health Monitoring*. AFIT/GSE/ENV/11-M04. Faculty Advisor: Dr. Som R. Soni. Sponsor: AFRL/RX.

BROWER, WADE W., *A Study of Corporate Entrepreneurship in a Department of Defense Organization*. AFIT/GEM/ENV/11-M01. Faculty Advisor: Lt Col John J. Elshaw. Sponsor: AFRL/RX.

CROZIER, STANLEY D., *Development of an Interference Lithography Capability Using a Helium Cadmium Ultraviolet Multimode Laser for the Fabrication of Sub-Micron-Structured Optical Materials*. AFIT/GE/ENG/11-07. Faculty Advisor: Dr. Michael M. Marciniak. Sponsor: AFRL/RX. [CDE]

JONES, TYLER P., *Tension-Compression Fatigue of Hi-Nicalon/SiC Ceramic Matrix Composite at 1200°C in Air and Steam*. AFIT/GA/ENY/11-M09. Faculty Advisor: Dr. Marina B. Ruggles-Wrenn. Sponsor: AFRL/RX.

JUSSAUME, MATTHEW E., *Electromagnetic Modeling and Measurement of Adaptive Metamaterial Structural Elements*. AFIT/GE/ENG/11-20. Faculty Advisor: Dr. Peter J. Collins. Sponsor: AFRL/RX.

KIER, TERRA J., *Optical Flow-Based Odometry for Underground Tunnel Exploration*. AFIT/GE/ENG/11-21. Faculty Advisor: Maj Kenneth A. Fisher. Sponsor: AFRL/RX. [ANT]

KNAUF, MICHAEL W., *Fatigue Behavior of a SiC/SiC Composite at 1000^o C in Air and in Steam*. AFIT/GAE/ENY/10-D01. Faculty Advisor: Dr. Marina B. Ruggles-Wrenn. Sponsor: AFRL/RX.

LOMBARDI, JACK P., *Optical Metamaterial Design, Fabrication and Test*. AFIT/GCE/ENG/11-25. Faculty Advisor: Dr. Ronald A. Coutu. Sponsor: AFRL/RX.

PALM, WILLIAM J., *Multilayer Insulation Laser Damage Characterization for Wavelength Scaling*. AFIT/GAP/ENP/11-M07. Faculty Advisor: Dr. Michael A. Marciniak. Sponsor: HELJTO & AFRL/RX. [CDE]

SHIN, HYOUNGJIN, See BECKETT, EDWARD.

AFRL: MUNITIONS DIRECTORATE

MASTER'S THESES

DOLCE, PAUL F., *A Statistical Approach to Fusing 2-D and 3-D LADAR Systems*. AFIT/GE/ENG/11-09. Faculty Advisor: Dr. Stephen C. Cain. Sponsor: AFRL/RW.

GRADUATE RESEARCH PAPERS

KRETSINGER, CHRISTOPHER D. & VARILEK, JOHN D., *High Velocity Penetrating Weapon Early Systems Engineering Study*. AFIT/ISE/ENV/11-J04. Faculty Advisor: Dr. John M. Colombi. Sponsor: AFRL/RW.

VARILEK, JOHN D., See KRETSINGER, CHRISTOPHER D.

AFRL: PROPULSION DIRECTORATE

DOCTORAL DISSERTATIONS

EASTERDAY, OLIVER T., *An Experimental Characterization of the Mechanical Properties of Thermal Barrier Coatings at Elevated Temperatures*. AFIT/DS/ENY/11-17. Faculty Advisor: Dr. Anthony N. Palazotto. Sponsor: AFRL/RZ.

LIU, DAVID, *Two-Dimensional, Time-Dependent Plasma Structures of a Hall Effect Thruster*. AFIT/DS/ENY/11-04. Faculty Advisor: Lt Col Richard D. Branam. Sponsor: AFRL/RZ.

MASTER'S THESES

BOHAN, BRIAN T., *Analysis of Flow Migration in an Ultra-Compact Combustor*. AFIT/GAE/ENY/11-M02. Faculty Advisor: Lt Col Frederick G. Harmon. Sponsor: AFRL/RZ.

BURROWS, SCOTT P., *Performance of a Double Bypass, Mixed Flow Turbofan in an Integrated Thermal Management System*. AFIT/GAE/ENY/11-M03. Faculty Advisor: Dr. Paul I. King. Sponsor: AFRL/RZ.

DAVIS, KRISTI R., *Verification and Validation of Component Cost Assessment Program (CCAP)*. AFIT/OR/MS/ENS/11-03. Faculty Advisor: Lt Col Stephen P. Chambal. Sponsor: AFRL/RZ. [COA]

DE LA HARPE, JOHN-DAVID C., *Performance Characterization of a Novel Plasma Thruster to Provide a Revolutionary Operationally Responsive Space Capability with Micro- and Nano-Satellites*. AFIT/GA/ENY/11-M02. Faculty Advisor: Lt Col Richard E. Huffman. Sponsor: AFRL/RZ.

GREISER, COLLIN, *Implementation of a Rule-Based Open-Loop Control Strategy for a Hybrid-Electric Propulsion System on a Small RPA*. AFIT/GA/ENY/11-M05. Faculty Advisor: Lt Col Frederick G. Harmon. Sponsor: AFRL/RZ.

HALL, JOSHUA N., *Optimized Dual Expander Aerospike Rocket*. AFIT/GAE/ENY/11-M10. Faculty Advisor: Lt Col Carl R. Hartsfield. Sponsor: AFRL/RZ.

HALVORSON, ELIAS J., *A Century Long Pursuit Of Alternative Fuels and Feedstocks: A Content Analysis*. AFIT/GFA/ENV/11-M01. Faculty Advisor: Dr. Charles A. Bleckmann. Sponsor: AFRL/RZ.

HEFFERNEN, JOSHUA J., *Characterization of Horizontally-Issuing Reacting Buoyant Jets*. AFIT/GAE/ENY/11-M12. Faculty Advisor: Lt Col Carl R. Hartsfield. Sponsor: AFRL/RZ.

HILLIER, ADAM C., *Revolutionizing Space Propulsion through the Characterization of Iodine as Fuel for Hall-Effect Thrusters*. AFIT/GA/ENY/11-M08. Faculty Advisor: Lt Col Richard E. Huffman. Sponsor: AFRL/RZ.

LONGO, NICHOLAS C., *Heat Transfer Experiments on a Pulse Detonation Driven Combustor*. AFIT/GAE/ENY/11-M18. Faculty Advisor: Dr. Paul I. King. Sponsor: AFRL/RZ.

MENGISTU, ISSEYAS H., *Small Internal Combustion Engine Testing for a Hybrid-Electric Remotely-Piloted Aircraft*. AFIT/GAE/ENY/11-M20. Faculty Advisor: Lt Col Frederick G. Harmon. Sponsor: AFRL/RZ.

NIELSEN, JEFFREY M., *Detonation Propagation through Ducts in a Pulsed Detonation Engine*. AFIT/GAE/ENY/11-M21. Faculty Advisor: Dr. Paul I. King. Sponsor: AFRL/RZ.

OBER, SCOTT T., *CubeSat Packaged Electrospray Thruster Evaluation for Enhanced Operationally Responsive Space Capabilities*. AFIT/GAE/ENY/11-M22. Faculty Advisor: Lt Col Richard E. Huffman. Sponsor: AFRL/RZ.

PEDERSON, DOUGLAS J., *Conceptual Design Tool to Analyze Electrochemically-Powered Micro Air Vehicles*. AFIT/GAE/ENY/11-M25. Faculty Advisor: Lt Col Frederick G. Harmon. Sponsor: AFRL/RZ.

PETERS, KENNETH G., *Global Strike Trajectory Optimization and Mission Planning Tool: A Systems Engineering Analysis*. AFIT/GSE/ENV/11-M01. Faculty Advisor: Dr. David R. Jacques. Sponsor: AFRL/RZ.

RIPPL, MATTHEW D., *Sizing Analysis for Aircraft Utilizing Hybrid-Electronic Propulsion Systems*. AFIT/GAE/ENY/11-M26. Faculty Advisor: Lt Col Frederick G. Harmon. Sponsor: AFRL/RZ.

ROTRAMEL, TODD A., *Optimization of Hybrid-Electric Propulsion Systems for Small Remotely-Piloted Aircraft*. AFIT/GAE/ENY/11-M27. Faculty Advisor: Lt Col Frederick G. Harmon. Sponsor: AFRL/RZ.

RUSSO, RACHEL M., *Operational Characteristics of a Rotating Detonation Engine using Hydrogen and Air*. AFIT/GAE/ENY/11-J03. Faculty Advisor: Dr. Paul I. King. Sponsor: AFRL/RZ.

SCHMICK, PETER J., *Effect of Atmospheric Pressure and Temperature on a Small Spark Ignition Internal Combustion Engine Performance*. AFIT/GAE/ENY/11-M28. Faculty Advisor: Dr. Marc D. Polanka. Sponsor: AFRL/RZ.

TEMKIN, SPENCER E., *Performance Characterization of a Three-axis Hall Effect Thruster*. AFIT/GAE/ENY/10-D02. Faculty Advisor: Lt Col Richard E. Huffman. Sponsor: AFRL/RZ.

WATSON, LEE I., *Using a Gatling-Gun Configured Micro Pulsed Plasma Thruster as a Means to Control Micro Satellites with Extreme Precision*. AFIT/GAE/ENY/11-M32. Faculty Advisor: Lt Col Richard E. Huffman. Sponsor: AFRL/RZ.

AFRL: SENSORS DIRECTORATE

DOCTORAL DISSERTATIONS

CLARK, JEFFREY D., *Distributed Spacing Stochastic Feature Selection and its Application to Textile Classification*. AFIT/DEE/ENG/11-05. Faculty Advisor: Maj Michael J. Mendenhall. Sponsor: AFRL/RZ.

HOELSCHER, MARK G., *Restoration of Scene Information Reflected from Non-Specular Media*. AFIT/DS/ENP/11-M03. Faculty Advisor: Dr. Michael A. Marciniak. Sponsor: AFRL/RZ. [CDE]

MORRISON, JAMIE R., *Vision Aided Inertial Navigation System Augmented with a Coded Aperture*. AFIT/DCE/ENG/10-14. Faculty Advisor: Dr. John F. Raquet. Sponsor: AFRL/Ry. [ANT]

RYER, DAVID M., *Quest Hierarchy for Hyperspectral Face Recognition*. AFIT/DS/ENS/10-03. Faculty Advisor: Dr. Kenneth W. Bauer. Sponsor: AFRL/Ry. [COA]

SECREST, BARRY R., *A Linear Combination of Heuristics Approach to Spatial Sampling Hyperspectral Data for Target Tracking*. AFIT/DEE/ENG/10-08. Faculty Advisor: Maj Michael J. Mendenhall. Sponsor: AFRL/Ry. [ANT]

YARBROUGH, ALLAN W., *Hyperspectral-Based Adaptive Matched Filter Detector Error as a Function of Atmospheric Profile Estimation*. AFIT/DEE/ENG/11-13. Faculty Advisor: Maj Michael J. Mendenhall. Sponsor: AFRL/Ry.

MASTER'S THESES

ATIENZA, DANIEL V., *Characterization of Noise Technology Radar Signal Detectability Using a Non-Cooperative Receiver*. AFIT/GE/ENG/11-01. Faculty Advisor: Dr. Michael A. Temple. Sponsor: AFRL/Ry.

CHICK, DAVID F., *Direction Finding with Mutually Orthogonal Antennas*. AFIT/GE/ENG/11-03. Faculty Advisor: Dr. Andrew J. Terzuoli. Sponsor: AFRL/Ry.

CORBIN, CLAIR F., *High Frequency Direction Finding Using Structurally Integrated Antennas on a Large Airborne Platform*. AFIT/GE/ENG/11-06. Faculty Advisor: Maj Geoffrey A. Akers. Sponsor: AFRL/Ry.

CURTIS, CHRISTOPHER K., *Improvements to Multiple Remotely Piloted Aircraft Surveillance Capabilities with Cooperative Ground Moving Target Indicator Assistance*. AFIT/GRD/ENV/11-J01. Faculty Advisor: Dr. John M. Colombi. Sponsor: AFRL/Ry.

FRYER, BRYON K., *Virtual Battlespace Behavior Generation through Class Imitation*. AFIT/GCO/ENG/11-04. Faculty Advisor: Lt Col Brett J. Borghetti. Sponsor: AFRL/Ry.

HANCOCK, DAVID, *A Multi Agent System for Flow-Based Intrusion Detection Using Reputation and Evolutionary Computation*. AFIT/GCS/ENG/11-02. Faculty Advisor: Dr. Gary B. Lamont. Sponsor: AFRL/Ry. [ANT]

HARDY, TYLER J., *Malicious and Malfunctioning Node Detection via Observed Physical Layer Data*. AFIT/GE/ENG/11-14. Faculty Advisor: Dr. Richard K. Martin. Sponsor: AFRL/Ry.

HAEUSER, MATTHEW A. & MAHAR, BRIAN J., *The Effect of Small Unmanned Aerial Vehicle Presence on Competing Layered Sensing Architectures*. AFIT/GSE/ENV/11-M06. Faculty Advisor: Dr. David R. Jacques. Sponsor: AFRL/Ry.

HOWARD, JAMES M., *Image Dependent Relative Formation Navigation for Autonomous Aerial Refueling*. AFIT/GE/ENG/11-16. Faculty Advisor: Lt Col Michael J. Veth. Sponsor: AFRL/Ry. [ANT]

LA TOUR, PAUL A., *Integrate-Modify-Create: Applying Multi-Criteria Decision Analysis to Rapid Prototyping*. AFIT/GSE/ENV/11-M07. Faculty Advisor: Dr. John M. Colombi. Sponsor: AFRL/Ry.

LEE, SPENSER D., *Routing UAVs to Co-Optimize Mission Effectiveness and Network Performance with Dynamic Programming*. AFIT/GCS/ENG/11-04. Faculty Advisor: Dr. Kenneth M. Hopkinson. Sponsor: AFRL/Ry. [ANT]

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MAHAR, BRIAN J., See HAEUSER, MATTHEW A.

MOHD-ZAID, MOHD FARUL, *Face Recognition via Ensemble Sift Matching of Uncorrelated Hyperspectral Bands and Spectral PCTS*. AFIT/OR/MS/ENS/11-16. Faculty Advisor: Dr. Kenneth W. Bauer. Sponsor: AFRL/R.Y. [COA]

NOEL, WILFRED E., *Signals of Opportunity Navigation Using Wi-Fi Signals*. AFIT/GCE/ENG/11-30. Faculty Advisor: Maj Kenneth A. Fisher. Sponsor: AFRL/R.Y. [ANT]

OLNEY, THOMAS S., *A Simple Non-Destructive Method for Characterizing Non-Dispersive, Low-Loss Dielectrics*. AFIT/GE/ENG/11-31. Faculty Advisor: Dr. Michael J. Havrilla. Sponsor: AFRL/R.Y.

OSTROW, SCOTT A., *Microelectromechanical Systems (MEMS) Designs for Anti-Tamper Response Applications*. AFIT/GE/ENG/11-32. Faculty Advisor: Dr. Ronald A. Coutu. Sponsor: AFRL/R.Y.

PRAHL, DAYVID, *Coupling Vanishing Point Tracking with Inertial Navigation to Estimate Attitude in a Structured Environment*. AFIT/GE/ENG/11-33. Faculty Advisor: Lt Col Michael J. Veth. Sponsor: AFRL/R.Y. [ANT]

PRIESTLY, JOHN A., *AFIT NoNET Enhancements: Software Model Development and Optimization of Signal Processing Architecture*. AFIT/GE/ENG/11-34. Faculty Advisor: Dr. Peter J. Collins. Sponsor: AFRL/R.Y.

RICE, ANDREW C., *Context Aided Tracking with Adaptive Hyperspectral Imagery*. AFIT/GE/ENG/11-43. Faculty Advisor: Dr. Juan R. Vasquez. Sponsor: AFRL/R.Y. [ANT]

RONDEAU, CHRISTOPHER M., *Navigation with Limited Prior Information Using Time Difference of Arrival Measurements from Signals of Opportunity*. AFIT/GE/ENG/10-32. Faculty Advisor: Dr. Richard K. Martin. Sponsor: AFRL/R.Y. [ANT]

SCOTT, AMBER L., *Effects of Cyclic Prefix Jamming Versus Noise Jamming in OFDM Signals*. AFIT/GE/ENG/11-35. Faculty Advisor: Dr. Richard K. Martin. Sponsor: AFRL/R.Y. [ANT]

STANTON, WILLIAM E., *Improved Key Generation Method Using Field Programmable Gate Arrays*. AFIT/GE/ENG/11-37. Faculty Advisor: Dr. Yong C. Kim. Sponsor: AFRL/R.Y.

TREJO, ROBERTO A., *Environment Condition Detection Using Field Programmable Gate Arrays*. AFIT/GCE/ENG/11-07. Faculty Advisor: Dr. Yong C. Kim. Sponsor: AFRL/R.Y.

WEEMS, MARK A., *Kernelized Locality-Sensitive Hashing for Fast Image Landmark Association*. AFIT/GE/ENG/11-40. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: AFRL/R.Y. [ANT]

WEYERS, CHRISTOPHER P., *Multiple Integrated Navigation Sensors for Improving Occupancy Grid FastSLAM*. AFIT/GCE/ENG/11-08. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: AFRL/R.Y. [ANT]

WILLIAMS, MCKAY D., *Application of RF-DNA Fingerprinting to Improve WiMAX Security*. AFIT/GE/ENG/11-41. Faculty Advisor: Dr. Michael A. Temple. Sponsor: AFRL/R.Y. [CCR]

GRADUATE RESEARCH PAPERS

ECKBERG, JASON A., *Cognitive Electronic Warfare: A Model for Future Electronic Warfare Systems*. AFIT/ICW/ENG/11-03. Faculty Advisor: Lt Col Michael J. Stepaniak. Sponsor: AFRL/R.Y. [ANT]

AFRL: SPACE VEHICLES DIRECTORATE

DOCTORAL DISSERTATIONS

CALLIHAN, ROBERT S., *Analysis of Transient Electromagnetic Scattering from an Overfilled Cavity Embedded in an Impedance Ground Plane*. AFIT/DAM/ENC/11-01. Faculty Advisor: Dr. Aihua W. Wood. Sponsor: AFRL/RV.

MASTER'S THESES

HESS, JOSHUAH A., *Osculating Relative Orbit Elements Resulting from Chief Eccentricity and J2 Perturbing Forces*. AFIT/GA/ENY/11-M07. Faculty Advisor: Lt Col Douglas D. Decker. Sponsor: AFRL/RV.

MCCHESNEY, CHRISTOPHER G., *Design of Attitude Control Actuators for a Simulated Spacecraft*. AFIT/GA/ENY/11-M12. Faculty Advisor: Dr. Eric D. Swenson. Sponsor: AFRL/RV.

AIR FORCE GLOBAL LOGISTICS SUPPORT CENTER

MASTER'S THESES

YEE, FLORENCE K., *Depot-Level Simulation and Multivariate Analysis on B-1 High Velocity Maintenance*. AFIT/OR/MS/ENS/11-26. Faculty Advisor: Dr. John O. Miller. Sponsor: 591 SCMG. [COA]

WAHOSKE, TED A., *Cost Effectiveness Approach to B-1B Consumable and Repairable Procurement Strategies*. AFIT/ILS/ENS/11-11. Faculty Advisor: Dr. John O. Miller. Sponsor: AFGLSC. [COA]

4.6. AIR FORCE GLOBAL STRIKE COMMAND

MASTER'S THESES

HAMILTON, JASON S., *Determining Pilot Manning for Bomber Longevity*. AFIT/OR/MS/ENS/11-08. Faculty Advisor: Dr. James W. Chrissis. Sponsor: 509 OG. [COA]

4.7. AIR MOBILITY COMMAND

MASTER'S THESES

BUCHHEIT, ERIC W., *Optimizing Ground Times for AMC Aircraft in Afghanistan*. AFIT/OR/MS/ENS/11-02. Faculty Advisor: Dr. James T. Moore. Sponsor: AMC/A9. [COA]

CAMMARANO, VINCENT R., *Estimating Cargo Airdrop Collateral Damage Risk*. AFIT/LSCM/ENS/11-02. Faculty Advisor: Dr. Jeffery K. Cochran. Sponsor: AMC/A2. [COA]

DICKENS, JOHN M., *Central Command Rest and Recuperation Hub-to-Hub Airlift Network Analysis*. AFIT/LSCM/ENS/11-03. Faculty Advisor: Dr. Pamela S. Donovan. Sponsor: AMC/A9. [COA]

GETZELMAN, ELLEN M., *An Analysis of Optimal Fuel Tankering in the C-17 Globemaster III to Address Differential Fuel Prices*. AFIT/GSE/ENV/11-S03DL. Faculty Advisor: Dr. John M. Colombi. Sponsor: AMC.

JONES, DUSTIN P., *Optimal CH-47 and C-130 Workload Balance*. AFIT/OR/MS/ENS/11-10. Faculty Advisor: Dr. James T. Moore. Sponsor: AMC/A9. [COA]

QUASHNE, MICHAEL R., *Application of Post Modern Portfolio Theory to Mitigate Risk in International Shipping*. AFIT/OR/MS/ENS-11-18. Faculty Advisor: Dr. James T. Moore. Sponsor: AMC/A9. [COA]

GRADUATE RESEARCH PAPERS

AXTELL, PETER G., *Value Focused Thinking Analysis of the Pacific Theater's Future Air Mobility En Route System*. AFIT/IMO/ENS/11-01. Faculty Advisor: Lt Col Joseph B. Skipper. Sponsor: HQ AMC. [COA]

BENTLEY, CASSIUS T., *Market Opportunity Analysis: Afghanistan Direct Delivery Strategic Opportunities*. AFIT/IMO/ENS/11-02. Faculty Advisor: Lt Col Doral E. Sandlin. Sponsor: HQ AMC. [COA]

BLAND, MATTHEW G., *The Impact of CRAF Activation Risk on Long-Run International Routes*. AFIT/IMO/ENS/11-03. Faculty Advisor: Dr. Pamela S. Donovan. Sponsor: HQ AMC. [COA]

FARRELL, PATRICK F., *Remotely Piloted Aircraft (RPA) Performing the Airdrop Mission*. AFIT/IMO/ENS/11-04. Faculty Advisor: Lt Col Joseph B. Skipper. Sponsor: HQ AMC. [COA]

HANFORD, JAMES R., *Effects of Contoured Pallets on AMC Mission Efficiency*. AFIT/IMO/ENS/11-05. Faculty Advisor: Dr. Joseph J. Pignatiello. Sponsor: HQ AMC. [COA]

HUGHES, JAROD C., *Direct Support of War Fighting Forces Using Apportioned Airlift*. AFIT/ILS/ENS/03-11. Faculty Advisor: Lt Col Joseph B. Skipper. Sponsor: HQ AMC. [COA]

LESINKSI, WALTER J., III, *Tankering Fuel: A Cost Saving Initiative*. AFIT/IMO/ENS/11-06. Faculty Advisor: Dr. Alan W. Johnson. Sponsor: HQ AMC. [COA]

LINCK, SCOTT C., *Tanker Fuel Consolidation: Impact of Fuel Efficiency on ATO Resiliency*. AFIT/IMO/ENS/11-07. Faculty Advisor: Dr. Alan W. Johnson. Sponsor: HQ AMC. [COA]

MCNEAL, TODD E., *Civil Reserve Air Flight - 60/40 Rule: The Case for a Reinstatement using Block Hours*. AFIT/IMO/ENS/11-10. Faculty Advisor: Dr. Pamela S. Donovan. Sponsor: HQ AMC. [COA]

MIRTICH, JOHN M., *Cost Index Flying*. AFIT/IMO/ENS/11-11. Faculty Advisor: Lt Col Doral E. Sandlin. Sponsor: HQ AMC. [COA]

TRICHE, WILLIAM P., *Dual Role Airlift: Fee for Service?* AFIT/IMO/ENS/11-14. Faculty Advisor: Dr. William A. Cunningham. Sponsor: HQ AMC. [COA]

VANN, MATTHEW T., *C-5 Channel Delays: Analysis of Potential Causal Factors*. AFIT/IMO/ENS/11-15. Faculty Advisor: Dr. Joseph J. Pignatiello. Sponsor: HQ AMC. [COA]

WILSON, SANDRA J., *The Impact of Increased Pallet Utilization on Intra-Theater Airlift*. AFIT/IMO/ENS/11-16. Faculty Advisor: Dr. Joseph J. Pignatiello. Sponsor: HQ AMC. [COA]

4.8. AIR FORCE SPACE COMMAND

MASTER'S THESES

HENRY, WAYNE C., *Covert Channels within IRC*. AFIT/GCE/ENG/11-04. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: 688 IOW. [CCR]

KESISIKLIS, ILIAS, *Major Cost Drivers of MVCs Cost Involving Air Force Personnel and the Influence of the Military Environment*. AFIT/GCA/ENV/11-S01. Faculty Advisor: Lt Col Dirk P. Yamamoto. Sponsor: AFSC.

MERRIT, DAVID T., *Spear Phishing Attack Detection*. AFIT/GCE/ENG/11-05. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: 688 IOW. [CCR]

GRADUATE RESEARCH PAPERS

BISHOP, BENJAMIN W., *An Assessment of Napoleonic Command and Control Principles in Air Force Network Defense Operations*. AFIT/ICW/ENG/11-02. Faculty Advisor: Capt Jonathan W. Butts. Sponsor: 561 NOS. [CCR]

LAVINE, DAVID A., *Leveraging ITIL/ITSM into Network Operations*. AFIT/ICW/ENG/11-07. Faculty Advisor: Capt Jonathan W. Butts. Sponsor: 561 NOS. [CCR]

MYERS, MICHAEL J., *Emerging Roles of Combat Communication Units in Cyber Warfare as Related to Computer Network Attack, Defense and Exploitation*. AFIT/ICW/ENG/11-10. Faculty Advisor: Dr. Michael R. Grimaila. Sponsor: 689 CCW. [CCR]

SPACE AND MISSILE SYSTEMS CENTER

MASTER'S THESES

BOND, ROBERT M., *Emerging Threat Detection Methods for GPS C/A Code Receivers*. AFIT/GE/ENG/11-02. Faculty Advisor: Dr. John F. Raquet. Sponsor: SMC. [ANT]

LEACH, DAVID A. & SEARLE, CHAD T., *Enterprise Requirements and Acquisition Model*. AFIT/ISE/ENV/11-J01. Faculty Advisor: Lt Col Joseph R. Wirthlin. Sponsor: SMC.

PHIPPS, SHAUN D. & WAGENBACH, PHILLIP F., *Human Systems Integration in Satellite Command & Control Systems: Lessons Learned from Multi-Mission Satellite Operations Center Ground System Architecture*. AFIT/GSE/ENV/11-S06DL. Faculty Advisor: Dr. John M. Colombi. Sponsor: SMC.

SEARLE, CHAD T., See LEACH, DAVID A.

SHIBATA, JASON T., *A Space Acquisition Leading Indicator Based On System Interoperation Maturity*. AFIT/GSE/ENV/10-D02DL. Faculty Advisor: Dr. John M. Colombi. Sponsor: SMC.

SNYDER, ERIC B., *Conceptual Design and Analysis of Service Oriented Architecture (SOA) for Command and Control of Space Assets*. AFIT/GSE/ENV/10-D04DL. Faculty Advisor: Dr. John M. Colombi. Sponsor: SMC.

WAGENBACH, PHILLIP F., See PHIPPS, SHAUN D.

4.9. USAF FIELD OPERATING AGENCIES/DIRECT REPORTING UNITS

AIR FORCE CENTER FOR ENGINEERING AND THE ENVIRONMENT

MASTER'S THESES

ROEN, DAVID T., *Modeling Vertical Flow Treatment Wetland Hydraulics to Optimize Treatment Efficiency*. AFIT/GES/ENV/11-M03. Faculty Advisor: Dr. Mark N. Goltz. Sponsor: AFCEE.

SURAJBALLY, KRISHNA R., *Risks Associated with Federal Construction Projects*. AFIT/GEM/ENV/11-J01. Faculty Advisor: Lt Col Peter P. Feng. Sponsor: AFCEE.

AIR FORCE CIVIL ENGINEER SUPPORT AGENCY

MASTER'S THESES

WINKLER, HANS U., *Optimization of Manpower Utilizing Empirical Data for Enduring Civil Engineering Operation's Flight at Al Udeid Air Base, Qatar*. AFIT/GEM/ENV/11-M07. Faculty Advisor: Lt Col William E. Sitzabee. Sponsor: AFCESA.

AIR FORCE MEDICAL OPERATIONS AGENCY

GRADUATE RESEARCH PAPERS

BENTON, TERECA V., *Data Envelopment Analysis to Assess Productivity in the United States Air Force Medical Supply Chain*. AFIT/ILS/ENS/11-01. Faculty Advisor: Lt Col Joseph B. Skipper. Sponsor: AFMOA. [COA]

AIR FORCE PERSONNEL CENTER

MASTER'S THESES

SCHMIDT, AMY L., *Alternative Active Duty Military Retirement Plan*. AFIT/GCA/ENS/11-02. Faculty Advisor: Dr. William A. Cunningham. Sponsor: HQ AFPC. [COA]

AIR FORCE WEATHER AGENCY

MASTER'S THESES

DOMM, PAUL H., *Verification of Global Assimilation of Ionospheric Measurements Gauss Markov (GAIM-GM) Model Forecast Accuracy*. AFIT/GAP/ENP/11-S01. Faculty Advisor: Lt Col Robb M. Randall. Sponsor: AFWA.

FENTON, KENNETH R., *Assessment of the Effects of Plasma Bubbles on GAIM-GM*. AFIT/GAP/ENP/11-S02. Faculty Advisor: Dr. William F. Bailey. Sponsor: AFWA.

JENNIGES, JANELLE V., *Sensitivity Analysis of Empirical Parameters in the Ionosphere-Plasmasphere Model*. AFIT/GAP/ENP/11-M03. Faculty Advisor: Lt Col Ariel O. Acebal. Sponsor: AFWA.

NAVA, OMAR A., *Analysis of Plasma Bubble Signatures in the Ionosphere*. AFIT/GAP/ENP/11-M06. Faculty Advisor: Dr. William F. Bailey. Sponsor: CASS & AFWA.

STEADMAN, LINDON H., *Effect of Storm Enhanced Densities on Geo-Location Accuracy Over CONUS*. AFIT/GAP/ENP/11-S03. Faculty Advisor: Lt Col Ariel O. Acebal. Sponsor: AFWA.

NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY

MASTER'S THESES

TUINSTRAL, JARED D., *Perimeter Security and Intruder Detection using Gravity Gradiometry: A Feasibility Study*. AFIT/GAE/ENY/11-M30. Faculty Advisor: Lt Col Richard E. Huffman. Sponsor: NGA.

4.10. DEPARTMENT OF DEFENSE

MASTER'S THESES

JEROME, CHRISTOPHER L., *Fixed-wing Aircraft Combat Survivability Analysis for Operation Enduring Freedom and Operation Iraqi Freedom*. AFIT/GAE/ENY/11-M14. Faculty Advisor: Lt Col Richard E. Huffman. Sponsor: JASPO.

MINITER, JEREMY M., *Modeling Enhanced Storage of Groundwater Contaminants Due to the Presence of Cracks in Low Permeability Zones Underlying Contaminant Source Areas*. AFIT/GES/ENV/11-M02. Faculty Advisor: Dr. Mark N. Goltz. Sponsor: SERDP.

DEFENSE THREAT REDUCTION AGENCY

DOCTORAL DISSERTATIONS

GORDON, JOE M., *Shock Wave Dynamics of Novel Aluminized Detonations and Empirical Model for Temperature Evolution from Post-Detonation Combustion Fireballs*. AFIT/DS/ENP/10-S03. Faculty Advisor: Dr. Glen P. Perram. Sponsor: DTRA. [CTISR]

MCHALE, STEPHEN R., *The Effects of Rare Earth Doping on Gallium Nitride Thin Films*. AFIT/DS/ENP/11-S05. Faculty Advisor: LTC John W. McClory. Sponsor: DTRA.

MASTER'S THESES

BEVINS, JAMES E., *Characterization of a Boron Carbide Heterojunction Neutron Detector*. AFIT/GNE/ENP/11-M02. Faculty Advisor: LTC John W. McClory. Sponsor: DTRA.

DUGAN, CHRISTINA L., *Cathodoluminescence and Photoemission of Undoped and Mn Doped Lithium Tetraborate*. AFIT/GNE/ENP/11-M05. Faculty Advisor: Dr. Robert L. Hengehold. Sponsor: DTRA.

DUNCAN, NICKOLAS A., *Changes to Electrical Conductivity in Irradiated Carbon Nanocomposites*. AFIT/GNE/ENP/11-M06. Faculty Advisor: LTC John W. McClory. Sponsor: DTRA.

FOSTER, JESSE C., *Radiation Effects on the Electrical Properties of Hafnium Oxide Based MOS Capacitors*. AFIT/GNE/ENP/11-M07. Faculty Advisor: LTC John W. McClory. Sponsor: DTRA.

HURST, ALEXIS X., *Modeling of Bacillus Spores: Inactivation and Outgrowth*. AFIT/GAM/ENC/11-01. Faculty Advisor: Dr. William P. Baker. Sponsor: AFNWC & DTRA.

KANANEN, BRANT E., *Characterization of Neutron-Induced Defects in Isotopically Enriched Lithium Tetraborate*. AFIT/GNE/ENP/11-M12. Faculty Advisor: LTC John W. McClory. Sponsor: DTRA.

PURCELL, EMILY A., *Cathodoluminescence of Irradiated Hafnium Dioxide*. AFIT/GAP/ENP/11-M08. Faculty Advisor: Dr. Robert L. Hengehold. Sponsor: DTRA.

RICHARDS, MICHAEL J., *Nuclear Weapon Yield Determination through Nano Indentation of Thermally Degraded Automobile Paint*. AFIT/GNE/ENP/11-M17. Faculty Advisor: Dr. James C. Petrosky. Sponsor: DTRA.

THOMAS, BENJAMIN R., *Neutron Detection Using Gadolinium-Based Diodes*. AFIT/GNE/ENP/11-M18. Faculty Advisor: LTC John W. McClory. Sponsor: DTRA.

WILLCOX, DANIEL T., *Adaptive Imaging Methods using a Rotating Modulation Collimator (RMC)*. AFIT/GNE/ENP/11-M20. Faculty Advisor: Maj Benjamin R. Kowash. Sponsor: DTRA.

HIGH ENERGY LASER JOINT TECHNOLOGY OFFICE

DOCTORAL DISSERTATIONS

ANDERSON, MONTE D., *Tunable Optical Delay in Doppler-Broadened Cesium Vapor*. AFIT/DS/ENP/10-S01. Faculty Advisor: Dr. Glen P. Perram. Sponsor: HELJTO. [CDE]

BELCHER, LACHLAN T., *Gradients and Non-Adiabatic Derivative Coupling Terms for Spin-Orbit Wavefunctions*. AFIT/DS/ENP/11-J01. Faculty Advisor: Dr. David E. Weeks. Sponsor: HELJTO. [CDE]

LEWIS, CHARLTON D., II, *Non-Adiabatic Atomic Transitions: Computational Cross Section Calculations of Alkali Metal-Noble Gas Collisions*. AFIT/DS/ENP/11-S04. Faculty Advisor: Dr. David E. Weeks. Sponsor: HELJTO. [CDE]

MASTER'S THESES

FOX, CHARLES D., *Radial Distribution of Absorption in a Cesium Heat Pipe with Axial Laser Heating*. AFIT/GAE/ENY/11-M09. Faculty Advisor: Dr. Glen P. Perram. Sponsor: HELJTO. [CDE]

GUILD, ERIC M., *Diffusion of Rubidium Vapor through Hollow-Core Fibers for Gas-Phase Fiber Lasers*. AFIT/OSE/ENP/11-M01. Faculty Advisor: Dr. Glen P. Perram. Sponsor: HELJTO. [CDE]

HURD, EDWARD J., *Characteristics of a High Intensity, Pulsed, Potassium Vapor Laser in a Heat Pipe*. AFIT/GE/ENG/11-17. Faculty Advisor: Lt Col Jeremy C. Holtgrave. Sponsor: HELJTO. [CDE]

HURST, BENJAMIN E., *High-Energy Laser Damage Testing on Painted Metals at 1.07 μm* . AFIT/GAP/ENP/11-M02. Faculty Advisor: Dr. Michael A. Marciniak. Sponsor: HELJTO. [CDE]

JONES, PAUL N., *Broadband Pumping Effects on the Diode Pumped Alkali Laser*. AFIT/GAP/ENP/11-M04. Faculty Advisor: Dr. Glen P. Perram. Sponsor: HELJTO.

PALM, WILLIAM J., *Multilayer Insulation Laser Damage Characterization for Wavelength Scaling*. AFIT/GAP/ENP/11-M07. Faculty Advisor: Dr. Michael A. Marciniak. Sponsor: HELJTO & AFRL/RX. [CDE]

SPENCER, MARK F., *Branch Point Mitigation of Thermal Blooming Phase Compensation Instability*. AFIT/OSE/ENP/11-M02. Faculty Advisor: Dr. Salvatore J. Cusumano. Sponsor: HELJTO. [CDE]

NATIONAL SECURITY AGENCY

MASTER'S THESES

GARCIA, ERIC W., *Evaluation of the Single Keybit Template Attack*. AFIT/GE/ENG/11-11. Faculty Advisor: Dr. Rusty O. Baldwin. Sponsor: NSA. [CCR]

STUECKLE, JONATHAN D., *Android Protection System: A Signed Code Security Mechanism for Smartphone Applications*. AFIT/GCE/ENG/11-06. Faculty Advisor: Dr. Rusty O. Baldwin. Sponsor: NSA. [CCR]

WOOLINGHAM, MICHAEL R., *Detecting Insider Threats on a Cisco Router Using the Native Functionality of the Internetwork Operating System*. AFIT/GCO/ENG/11-17. Faculty Advisor: Dr. Robert F. Mills. Sponsor: NSA. [CCR]

OFFICE OF THE SECRETARY OF DEFENSE

MASTER'S THESES

DARVILL, WHITICAR S., *Virtualness of the Cost Estimating Community*. AFIT/GCA/ENV/11-M01. Faculty Advisor: Lt Col Eric J. Unger. Sponsor: OSD.

KEATON, CHARLES F., *Real-Time Problem Detection in Acquisition Contracts*. AFIT/GCA/ENC/11-01. Faculty Advisor: Dr. Edward D. White. Sponsor: OSD.

KILLALY, MICHAEL S., *I Can, but I Won't: An Exploratory Study on People and New Information Technologies in the Military*. AFIT/GIR/ENV/11-M03. Faculty Advisor: Lt Col Gregory M. Schechtman. Sponsor: OSD.

ROSADO, WILLIAM R., *Comparison of Development Test and Evaluation and Overall Program Estimate at Completion*. AFIT/GCA/ENC/11-02. Faculty Advisor: Dr. Edward D. White. Sponsor: OSD.

SWEARINGEN, ROBERT J., *Understanding Evolved Expendable Launch Vehicle Capacity using an Arena Discrete-Event Simulation Model*. AFIT/OR/MS/ENS/11-22. Faculty Advisor: Lt Col Stephen P. Chambal. Sponsor: OSD. [COA]

GRADUATE RESEARCH PAPERS

BECKER, JAMES A. & VETTER, SHANE M., *Analysis of Capability and Design Flexibility*. AFIT/ISE/ENV/11-J02. Faculty Advisor: Dr. David R. Jacques. Sponsor: OSD.

VETTER, SHANE M., See BECKER, JAMES A.

WILSON, JAMES G., *Examining the Statistical Rigor of Test and Evaluation Results in the Live, Virtual and Constructive Environment*. AFIT/IOA/ENS/11-06. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: OSD. [COA]

UNITED STATES ARMY

MASTER'S THESES

DICKERSON, STEPHEN M., *CH-47D Rotating System Fault Sensing for Condition Based Maintenance*. AFIT/GAE/ENV/11-M08. Faculty Advisor: Dr. Donald L. Kunz. Sponsor: AMRDEC.

UNITED STATES EUROPEAN COMMAND

GRADUATE RESEARCH PAPERS

OLSEN, CHRISTOPHER M., *Simulation Study of Evacuation Control Center Operations Analysis*. AFIT/IOA/ENS/11-04. Faculty Advisor: Dr. John O. Miller. Sponsor: EUCOM. [COA]

SCHEER, MARK A., *Noncombatant Evacuation Operations in USEUCOM*. AFIT/IOA/ENS/11-05. Faculty Advisor: Dr. John O. Miller. Sponsor: EUCOM. [COA]

UNITED STATES NAVY

MASTER'S THESES

HALSTEAD, MATTHEW R., *Characterization of the Neutron Spectrum at the Indiana University Neutron Source*. AFIT/GNE/ENP/11-M08. Faculty Advisor: Dr. James C. Petrosky. Sponsor: NSWC.

SONG, MUJUN, *Characterizing Cyclostationary Features of Digital Modulated Signals with Empirical Measurements Using Spectral Correlation Function*. AFIT/GCE/ENG/11-09. Faculty Advisor: Maj Ryan W. Thomas. Sponsor: ONR.

UNITED STATES NORTHERN COMMAND

MASTER'S THESES

MERRITT, KASSANDRA M., *Coverage of Continuous Regions in Euclidean Space using Homogeneous Resources with Application to the Allocation of the Phased Array Radar Systems*. AFIT/GA/ENC/11-01. Faculty Advisor: Lt Col Karen E. Dillard. Sponsor: USNORTHCOM. [COA]

UNITED STATES SPECIAL OPERATIONS COMMAND

MASTER'S THESES

BERNARDONI, BRANDON J., *Utilizing Social Network Analysis in Support of Nation Building*. AFIT/OR/MS/ENS/11-01. Faculty Advisor: Dr. Richard F. Deckro. Sponsor: USSOCOM.

MCGUIRE, RYAN M., *Weighted Key Player Problem for Social Network Analysis*. AFIT/OR/MS/ENS/11-13. Faculty Advisor: Dr. Richard F. Deckro. Sponsor: USSOCOM.

THOMPSON, MICHAEL J., *Migration Issues in the Democratic Republic of Congo*. AFIT/OR/MS/ENS/11-24. Faculty Advisor: Dr. Richard F. Deckro. Sponsor: USSOCOM.

UNITED STATES STRATEGIC COMMAND

MASTER'S THESES

HEERSCHE, JASON E., *Analysis of a Revolutionary Aircraft Combat Survivability Planning Tool*. AFIT/GAE/ENY/11-M11. Faculty Advisor: Lt Col Richard E. Huffman. Sponsor: USSTRATCOM.

MARTINEZ, JACOB A., *Soft Systems Methodology Applied to the Joint Information Operation Warfare Center (JIOWC) Organization*. AFIT/GSE/ENV/10-D03DL. Faculty Advisor: Dr. John M. Colombi. Sponsor: JIOWC.

OLSEN, SUSAN R., *Mission Assurance Analysis of Theater Ballistic Missile Defense Systems (TBMDs)*. AFIT/ISE/ENV/11-S01. Faculty Advisor: Dr. Michael R. Grimaila. Sponsor: USSTRATCOM.

UNITED STATES TRANSPORTATION COMMAND

MASTER'S THESES

STACK, DONALD A., *Impact of Coalition Requirements on Transportation*. AFIT/OR/MS/ENS/11-21. Faculty Advisor: Dr. James T. Moore. Sponsor: USTRANSCOM. [COA]

GRADUATE RESEARCH PAPERS

JENSEN, TODD M., *The Impact of Coalition Movements on Airlift Projections*. AFIT/ILS/ENS/11-04. Faculty Advisor: Dr. William A. Cunningham. Sponsor: USTRANSCOM. [COA]

LYNCH, PHILIP W., *Hybrid Airships: Intratheater Operations Cost-Benefit Analysis*. AFIT/IMO/ENS/11-08. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: USTRANSCOM. [COA]

MARKWART, TODD C., *A Study in Sea-Air Intermodal Port Selection: Strategic Decision Making for United States Southern Command*. AFIT/ILS/ENS/11-07. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: USTRANSCOM. [COA]

SHEA, PHILLIP A., *Sea-Air Intermodal Port Pair Selection Criteria in South America*. AFIT/IMO/ENS/11-12. Faculty Advisor: Lt Col Doral E. Sandlin. Sponsor: USTRANSCOM. [COA]

4.11. OTHER FEDERAL AGENCIES

DEPARTMENT OF ENERGY

MASTER'S THESES

ANTHONY, DAVID A., *Background and Source Term Identification in Active Neutron Interrogation Methods*. AFIT/GNE/ENP/11-M01. Faculty Advisor: Maj Benjamin R. Kowash. Sponsor: DOE.

DAHL, KRISTOFER R., *Combined Effects of Radio Frequency and Electron Radiation on CMOS Inverters*. AFIT/GNE/ENP/11-M03. Faculty Advisor: Dr. James C. Petrosky. Sponsor: DOE.

DAILEY, WHITMAN T., *Ray Next Event Estimator Transport of Primary and Secondary Gamma Rays*. AFIT/GNE/ENP/11-M04. Faculty Advisor: Dr. Kirk A. Mathews. Sponsor: DOE.

MAY, ROSE E., *Investigation of Gate Leakage Current in Nitrogen-Irradiated AlGaIn/GaN Heterostructures*. AFIT/GNE/ENP/11-M14. Faculty Advisor: Dr. James C. Petrosky. Sponsor: DOE.

MEYER, PAUL E., *Power Law Discrimination of Electromagnetic Pulse Signals*. AFIT/GNE/ENP/11-M15. Faculty Advisor: Lt Col Jeremy C. Holtgrave. Sponsor: DOE Los Alamos National Laboratory.

DEPARTMENT OF HOMELAND SECURITY

MASTER'S THESES

HARRELL, WILLIAM L., *Directional Pair-Production Spectrometer Design for Airborne Stand-Off Detection of Special Nuclear Material*. AFIT/GNE/ENP/11-M09. Faculty Advisor: Maj Benjamin R. Kowash. Sponsor: DHS.

JONES, BRADLEY S., *Investigation of YAG:Ce Scintillating Fiber Properties Using Silicon Photomultipliers*. AFIT/GNE/ENP/11-M11. Faculty Advisor: Maj Benjamin R. Kowash. Sponsor: DHS.

SMITH, JUSTIN M., *Source Normalization Constants for Ground Distributed Fallout Fields*. AFIT/GNE/ENP/11-S02. Faculty Advisor: Dr. Charles J. Bridgman. Sponsor: DHS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

MASTER'S THESES

FIRTH, JORDAN A., *Vibration Interaction in a Multiple Flywheel System*. AFIT/GA/ENY11-M03. Faculty Advisor: Dr. Jonathan T. Black. Sponsor: NASA Goddard Research Center.

4.12. NON-FEDERAL SPONSORS

DRAPER LABORATORY

MASTER'S THESES

BEICH, JONATHAN W., *Vision-Aided Autonomous Precision Weapon Terminal Guidance Using a Tightly-Coupled INS and Predictive Rendering Techniques*. AFIT/GE/ENG/11-42. Faculty Advisor: Lt Col Michael J. Veth. Sponsor: Draper Laboratory. [ANT]

MASSACHUSETTS INSTITUTE OF TECHNOLOGY LINCOLN LABORATORY

MASTER'S THESES

PAYTE, PATRICK J., *Orbit Determination and Prediction for Uncorrelated Target Detection and Tracking*. AFIT/GAE/ENY/11-J05. Faculty Advisor: Dr. William E. Wiesel. Sponsor: MIT Lincoln Lab.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

MASTER'S THESES

MULL, DALE M., *Paint Pavement Marking Performance Prediction Model that Includes the Impacts of Snow Removal Operations*. AFIT/GEM/ENV/11-M04. Faculty Advisor: Lt Col William E. Sitzabee. Sponsor: NC DOT.

NEEDHAM, JONATHAN D., *Degradation Modeling of Polyurea Pavement Markings*. AFIT/GEM/ENV/11-M05. Faculty Advisor: Lt Col William E. Sitzabee. Sponsor: NC DOT.

RAYTHEON

MASTER'S THESES

LICHTFUSS, ERICH H., *Non-GPS Navigation Using Vision-Aiding and Active Radio Range Measurements*. AFIT/GE/ENG/11-23. Faculty Advisor: Lt Col Michael J. Veth. Sponsor: Raytheon. [ANT]

REPUBLIC OF KOREA ARMY

MASTER'S THESES

JUNG, SUNGTAE, *Improving Way of Logistics Management in Korean Army*. AFIT/LSCM/ENS/11-06. Faculty Advisor: Dr. William A. Cunningham. Sponsor: ROKA. [COA]

SAUDI ARABIA'S MINISTRY OF DEFENSE AND AVIATION

MASTER'S THESES

ALZBEN, MOHAMMED I., *The Impact of Environmental Factors on Internal Integration in Support of Supply Chain Management*. AFIT/LSCM/ENS/11-01. Faculty Advisor: Lt Col Doral E. Sandlin. Sponsor: Saudi Arabia's Ministry of Defense and Aviation. [COA]

TURKISH AIR FORCE

MASTER'S THESES

DURKAN, MEHMET, *Multi Objective Decision Analysis for Assignment Problems*. AFIT/OR/MS/ENS/11-05. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: TuAF. [COA]

OKTAY, HALIT, *Airborne Pseudolites in a Global Positioning System Degraded*. AFIT/GSS/ENY/11-M03. Faculty Advisor: Lt Col Michael J. Stepaniak. Sponsor: TuAF. [ANT]

MALYEMEZ, CEM, *Multi Criteria Decision Support Model for the Turkish Air Force Personnel Course/ Education Planning System*. AFIT/OR/MS/ENS-11-12. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: TuAF. [COA]

UTAH STATE UNIVERSITY

MASTER'S THESES

NAVA, OMAR A., *Analysis of Plasma Bubble Signatures in the Ionosphere*. AFIT/GAP/ENP/11-M06.

Faculty Advisor: Dr. William F. Bailey. Sponsor: CASS & AFWA.

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

ANDERSON, MICHAEL L., *Design and Control of Flapping Wing Micro Air Vehicles*. AFIT/DS/ENY/11-12. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: AFRL/RB.

ARMANI, CLINTON J., *Creep Performance of Oxide Ceramic Fiber Materials at Elevated Temperature in Air and in Steam*. AFIT/DS/ENY/11-02. Faculty Advisor: Dr. Marina B. Ruggles-Wrenn. Sponsor: AFRL/RX.

CALLAWAY, DAVID W., *Photogrammetric Measurement of Recession Rates of Low Temperature Ablators Subjected to High Speed Flow*. AFIT/DS/ENY/11-03. Faculty Advisor: Dr. Mark F. Reeder. Sponsor: AFRL/RB.

EASTERDAY, OLIVER T., *An Experimental Characterization of the Mechanical Properties of Thermal Barrier Coatings at Elevated Temperatures*. AFIT/DS/ENY/11-17. Faculty Advisor: Dr. Anthony N. Palazotto. Sponsor: AFRL/RZ.

LIU, DAVID, *Two-Dimensional, Time-Dependent Plasma Structures of a Hall Effect Thruster*. AFIT/DS/ENY/11-04. Faculty Advisor: Lt Col Richard D. Branam. Sponsor: AFRL/RZ.

REYNOLDS, TINA H., *Flow Control Application on a Submerged Inlet Characterized by Three-Component LDV*. AFIT/DS/ENY/10-D03. Faculty Advisor: Dr. Mark F. Reeder. Sponsor: AFRL/RB.

ROSS, STEVEN M., *Stochastic Real-time Optimal Control: A Pseudospectral Approach for Bearing-Only Trajectory Optimization*. AFIT/DS/ENY/11-24. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: AFRL/RB.

STULTS, JOSHUA A., *Nonintrusive Microwave Diagnostics of Collisional Plasmas in Hall Thrusters and Dielectric Barrier Discharges*. AFIT/DS/ENY/11-15. Faculty Advisor: Dr. Mark F. Reeder. Sponsor: AFOSR.

5.1.2. MASTER'S THESES

BARKER, RICHARD T., *Satellite Detection by Doppler Shifted Signals off of the Air Force Space Surveillance System*. AFIT/GSS/ENY/11-M01. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: N/A.

BENHASSEN, FIRAS, *Time Resolved Filtered Rayleigh Scattering Measurement of a Centrifugally Loaded Buoyant Jet*. AFIT/GAE/ENY/11-M01. Faculty Advisor: Dr. Marc D. Polanka. Sponsor: AFOSR.

BETTINGER, ROBERT A., *Spacecraft Demand Tasking and Skip Entry Responsive Maneuvers*. AFIT/GA/ENY/11-J03. Faculty Advisor: Dr. Jonathan T. Black. Sponsor: N/A.

BOHAN, BRIAN T., *Analysis of Flow Migration in an Ultra-Compact Combustor*. AFIT/GAE/ENY/11-M02. Faculty Advisor: Lt Col Frederick G. Harmon. Sponsor: AFRL/RZ.

BRIGGS, GREGORY C., *Satellite Detection and Real-time Orbit Estimation with Commercial Telescopes*. AFIT/GA/ENY/11-J01. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: N/A.

BURROWS, SCOTT P., *Performance of a Double Bypass, Mixed Flow Turbofan in an Integrated Thermal Management System*. AFIT/GAE/ENY/11-M03. Faculty Advisor: Dr. Paul I. King. Sponsor: AFRL/RZ.

CAHOON, TROY L., *Airborne Wind Energy: Implementation and Design for the U.S. Air Force*. AFIT/GAE/ENY/11-M04. Faculty Advisor: Lt Col Frederick G. Harmon. Sponsor: N/A.

CHOI, YOUNGDONG, *Characterizing Cyclostationary Features of Digital Modulated Signals with Empirical Measurements using Spectral Correlation Function*. AFIT/GAE/ENY/11-J06. Faculty Advisor: Dr. Meir N. Pachter. Sponsor: AFRL/RB.

CHONG, KENNETH Y., *Evaluation of Nanocomposites for Shielding Electromagnetic Interference*. AFIT/GAE/ENY/11-S01. Faculty Advisor: Dr. Shankar Mall. Sponsor: N/A.

COLEY, CHRISTOPHER J., *An Investigation of Cavity Resonance and its Relationship to Store Force and Moment Loading*. AFIT/GAE/ENY/11-M05. Faculty Advisor: Maj Andrew J. Lofthouse. Sponsor: AFSEO.

COLLINS, NATHAN S., *Investigation of User Position Error Prediction and Navigation Upload Management for the GPS Mission*. AFIT/GA/ENY/11-M01. Faculty Advisor: Dr. Jonathan T. Black. Sponsor: N/A.

DAWSON, DAVID S., *Repeatable Manufacture of Wings for Flapping Wing Micro Air Vehicles using Microelectromechanical System (MEMS) Fabrication Techniques*. AFIT/GAE/ENY/11-M06. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: AFRL/RB.

DE LA HARPE, JOHN-DAVID C., *Performance Characterization of a Novel Plasma Thruster to Provide a Revolutionary Operationally Responsive Space Capability with Micro- and Nano-Satellites*. AFIT/GA/ENY/11-M02. Faculty Advisor: Lt Col Richard E. Huffman. Sponsor: AFRL/RZ.

DEBES, JOSHUA M., *Development of Infrastructure and Space Hardware for the ALICE CubeSat Mission*. AFIT/GSS/ENY/11-M02. Faculty Advisor: Dr. Jonathan T. Black. Sponsor: N/A.

DELEON, NATHANIAL E., *Manufacturing and Evaluation of a Biologically Inspired Engineered MAV Wing Compared to the Manduca Sexta Wing Under Simulated Flapping Conditions*. AFIT/GAE/ENY/11-M07. Faculty Advisor: Dr. Anthony N. Palazotto. Sponsor: AFOSR & AFRL/RB.

DICKERSON, STEPHEN M., *CH-47D Rotating System Fault Sensing for Condition Based Maintenance*. AFIT/GAE/ENY/11-M08. Faculty Advisor: Dr. Donald L. Kunz. Sponsor: AMRDEC.

DRISKELL, JAY W., *Low Earth Orbit Satellite Tracking Telescope Network: TELETRAKNET*. AFIT/GA/ENY/11-S01. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: N/A.

FIRTH, JORDAN A., *Vibration Interaction in a Multiple Flywheel System*. AFIT/GA/ENY11-M03. Faculty Advisor: Dr. Jonathan T. Black. Sponsor: NASA Goddard Research Center.

FOX, CHARLES D., *Radial Distribution of Absorption in a Cesium Heat Pipe with Axial Laser Heating*. AFIT/GAE/ENY/11-M09. Faculty Advisor: Dr. Glen P. Perram. Sponsor: HELJTO. [CDE]

FREY, GREGORY R., *KAM Torus Frequency Generation from Two-Line Element Sets*. AFIT/GA/ENY/11-M04. Faculty Advisor: Dr. William E. Wiesel. Sponsor: N/A.

GREISER, COLLIN, *Implementation of a Rule-Based Open-Loop Control Strategy for a Hybrid-Electric Propulsion System on a Small RPA*. AFIT/GA/ENY/11-M05. Faculty Advisor: Lt Col Frederick G. Harmon. Sponsor: AFRL/RZ.

HAGEN, LUKE J., *Effects of Air Drag and Lunar Third-Body Perturbations on Motion Near a Reference KAM Torus*. AFIT/GA/ENY/11-M06. Faculty Advisor: Dr. William E. Wiesel. Sponsor: N/A.

HALL, JOSHUA N., *Optimized Dual Expander Aerospike Rocket*. AFIT/GAE/ENY/11-M10. Faculty Advisor: Lt Col Carl R. Hartsfield. Sponsor: AFRL/RZ.

HEERSCHE, JASON E., *Analysis of a Revolutionary Aircraft Combat Survivability Planning Tool*. AFIT/GAE/ENY/11-M11. Faculty Advisor: Lt Col Richard E. Huffman. Sponsor: USSTRATCOM.

HEFFERNEN, JOSHUA J., *Characterization of Horizontally-Issuing Reacting Buoyant Jets*. AFIT/GAE/ENY/11-M12. Faculty Advisor: Lt Col Carl R. Hartsfield. Sponsor: AFRL/RZ.

HESS, JOSHUAH A., *Osculating Relative Orbit Elements Resulting from Chief Eccentricity and J2 Perturbing Forces*. AFIT/GA/ENY/11-M07. Faculty Advisor: Lt Col Douglas D. Decker. Sponsor: AFRL/RV.

HILLIER, ADAM C., *Revolutionizing Space Propulsion through the Characterization of Iodine as Fuel for Hall-Effect Thrusters*. AFIT/GA/ENY/11-M08. Faculty Advisor: Lt Col Richard E. Huffman. Sponsor: AFRL/RZ.

JEROME, CHRISTOPHER L., *Fixed-wing Aircraft Combat Survivability Analysis for Operation Enduring Freedom and Operation Iraqi Freedom*. AFIT/GAE/ENY/11-M14. Faculty Advisor: Lt Col Richard E. Huffman. Sponsor: JASPO.

JELIC, RENATO, *Study of Varying Boundary Layer Height on Turret Flow Structures*. AFIT/GAE/ENY/11-J01. Faculty Advisor: Dr. Robert B. Greendyke. Sponsor: AFRL/RB.

JONES, TYLER P., *Tension-Compression Fatigue of Hi-Nicalon/SiC Ceramic Matrix Composite at 1200°C in Air and Steam*. AFIT/GA/ENY/11-M09. Faculty Advisor: Dr. Marina B. Ruggles-Wrenn. Sponsor: AFRL/RX.

KASZYNSKI, ALEXANDER A., *X-HALE: The Development of a Research Platform for the Validation of Nonlinear Aeroelastic Codes*. AFIT/GAE/ENY/11-M15. Faculty Advisor: Lt Col Christopher M. Shearer. Sponsor: AFRL/RB.

KASZYNSKI, BROOKE E., *Simulations for the Test Flight of an Experimental HALE Aircraft*. AFIT/GAE/ENY/11-J02. Faculty Advisor: Lt Col Christopher M. Shearer. Sponsor: AFRL/RB.

KIM, TAE H., *Follower-Force Experiments with Geometric Non-Linear Coupling for Analytical Validation*. AFIT/GA/ENY/11-M10. Faculty Advisor: Dr. Eric D. Swenson. Sponsor: AFRL/RB.

KNAUF, MICHAEL W., *Fatigue Behavior of a SiC/SiC Composite at 1000°C in Air and in Steam*. AFIT/GAE/ENY/10-D01. Faculty Advisor: Dr. Marina B. Ruggles-Wrenn. Sponsor: AFRL/RX.

KRUSE, ADAM J., *Hypersonic High Angle of Attack Flow Effects*. AFIT/GAE/ENY/11-M16. Faculty Advisor: Dr. Robert B. Greendyke. Sponsor: AFRL/RB.

KURTZ, GARRETT M., *Notch Sensitivity of Fatigue Behavior of a Hi-Nicalon/SiC Ceramic Composite with an Oxidation Inhibited Matrix at 1200°C in Air and in Steam*. AFIT/GAE/ENY/11-M17. Faculty Advisor: Dr. Marina B. Ruggles-Wrenn. Sponsor: N/A.

LESAR, MARK B., *Design and Development of a Dynamic Two-Way Time Transfer Experiment Utilizing a 3U CubeSat*. AFIT/GA/ENY/11-M11. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: N/A.

LONGO, NICHOLAS C., *Heat Transfer Experiments on a Pulse Detonation Driven Combustor*. AFIT/GAE/ENY/11-M18. Faculty Advisor: Dr. Paul I. King. Sponsor: AFRL/RZ.

MASSETT, ANTHONY P., *AIM-9 Control Surface Effects on Subsonic LCO Analysis for F-16 Store Configuration Clearance*. AFIT/GAE/ENY/11-M19. Faculty Advisor: Dr. Donald L. Kunz. Sponsor: AFSEO.

MCCHESNEY, CHRISTOPHER G., *Design of Attitude Control Actuators for a Simulated Spacecraft*. AFIT/GA/ENY/11-M12. Faculty Advisor: Dr. Eric D. Swenson. Sponsor: AFRL/RV.

MENGISTU, ISSEYAS H., *Small Internal Combustion Engine Testing for a Hybrid-Electric Remotely-Piloted Aircraft*. AFIT/GAE/ENY/11-M20. Faculty Advisor: Lt Col Frederick G. Harmon. Sponsor: AFRL/RZ.

MORAN, GREGORY M., *Augmentation of a Ground-Based Satellite-Tracking Telescope System*. AFIT/GAE/ENY/11-M13. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: N/A.

NIELSEN, JEFFREY M., *Detonation Propagation through Ducts in a Pulsed Detonation Engine*. AFIT/GAE/ENY/11-M21. Faculty Advisor: Dr. Paul I. King. Sponsor: AFRL/RZ.

OBER, SCOTT T., *CubeSat Packaged Electrospray Thruster Evaluation for Enhanced Operationally Responsive Space Capabilities*. AFIT/GAE/ENY/11-M22. Faculty Advisor: Lt Col Richard E. Huffman. Sponsor: AFRL/RZ.

OKTAY, HALIT, *Airborne Pseudolites in a Global Positioning System Degraded*. AFIT/GSS/ENY/11-M03. Faculty Advisor: Lt Col Michael J. Stepaniak. Sponsor: TuAF. [ANT]

PAUL, MICHAEL C., *Experimental Measurements of Store Separation Using Dry Ice Models in A Subsonic Flow*. AFIT/GAE/ENY/11-M23. Faculty Advisor: Dr. Mark F. Reeder. Sponsor: AFRL/RB.

PAYTE, PATRICK J., *Orbit Determination and Prediction for Uncorrelated Target Detection and Tracking*. AFIT/GAE/ENY/11-J05. Faculty Advisor: Dr. William E. Wiesel. Sponsor: MIT Lincoln Lab.

PEDERSON, DOUGLAS J., *Conceptual Design Tool to Analyze Electrochemically-Powered Micro Air Vehicles*. AFIT/GAE/ENY/11-M25. Faculty Advisor: Lt Col Frederick G. Harmon. Sponsor: AFRL/RZ.

NIEDERHAUSER, JASON D., *Design and Characterization of a Space Based Chromotomographic Hyperspectral Imaging Experiment*. AFIT/GA/ENY/11-J02. Faculty Advisor: Dr. Jonathan T. Black. Sponsor: N/A.

RIPPL, MATTHEW D., *Sizing Analysis for Aircraft Utilizing Hybrid-Electronic Propulsion Systems*. AFIT/GAE/ENY/11-M26. Faculty Advisor: Lt Col Frederick G. Harmon. Sponsor: AFRL/RZ.

ROTRAMEL, TODD A., *Optimization of Hybrid-Electric Propulsion Systems for Small Remotely-Piloted Aircraft*. AFIT/GAE/ENY/11-M27. Faculty Advisor: Lt Col Frederick G. Harmon. Sponsor: AFRL/RZ.

RUSSO, RACHEL M., *Operational Characteristics of a Rotating Detonation Engine using Hydrogen and Air*. AFIT/GAE/ENY/11-J03. Faculty Advisor: Dr. Paul I. King. Sponsor: AFRL/RZ.

SCHMICK, PETER J., *Effect of Atmospheric Pressure and Temperature on a Small Spark Ignition Internal Combustion Engine Performance*. AFIT/GAE/ENY/11-M28. Faculty Advisor: Dr. Marc D. Polanka. Sponsor: AFRL/RZ.

SENEY, STEVEN D., JR., *Increasing the Performance of a Sliding Discharge Actuator through the Application of Multiple Potentials*. AFIT/GA/GAE/ENY/11-S01. Faculty Advisor: Lt Col Richard E. Huffman. Sponsor: AFOSR.

SINNOKRAK, NICHOLAS A., *Process for Refining and Validating a Finite Element Model of an Experimental High-Altitude, Long-Endurance (HALE) Aircraft*. AFIT/GAE/ENY/11-J04. Faculty Advisor: Lt Col Christopher M. Shearer. Sponsor: AFRL/RB.

SLADEK, NATHANAEL J., *Flapping Wing Micro Air Vehicle Wing Manufacture and Force Testing*. AFIT/GA/ENY/11-M14. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: AFRL/RB.

SUMMERS, SARAH E., *Improved Collision Modeling for Direct Simulation Monte Carlo Methods*. AFIT/GAE/ENY/11-M29. Faculty Advisor: Dr. Robert B. Greendyke. Sponsor: AFOSR.

TEMKIN, SPENCER E., *Performance Characterization of a Three-axis Hall Effect Thruster*. AFIT/GAE/ENY/10-D02. Faculty Advisor: Lt Col Richard E. Huffman. Sponsor: AFRL/RZ.

TUBBS, TRAVIS B., *Biological Investigation of the Stimulated Flapping Motions of the Moth, Manduca Sexta*. AFIT/GSS/ENY/11-M04. Faculty Advisor: Dr. Anthony N. Palazotto. Sponsor: AFOSR & AFRL/RB.

TUINSTRA, JARED D., *Perimeter Security and Intruder Detection using Gravity Gradiometry: A Feasibility Study*. AFIT/GAE/ENY/11-M30. Faculty Advisor: Lt Col Richard E. Huffman. Sponsor: NGA.

USRY, SIDNEY J., *Using Specific Excess Power Estimation in Flight Test Planning to Improve Safety and Efficiency*. AFIT/GAE/ENY/11-M31. Faculty Advisor: Lt Col Richard E. Huffman. Sponsor: 412 OG.

WAHLQUIST, JOSEPH A., *Effects of Prior Aging at 274⁰C in Argon on Inelastic Deformation Behavior of PMR-15 Polymer at 288⁰C: Experiment and Modeling*. AFIT/GAE/ENY/10-D03. Faculty Advisor: Dr. Marina B. Ruggles-Wrenn. Sponsor: AFOSR.

WATSON, LEE I., *Using a Gatling-Gun Configured Micro Pulsed Plasma Thruster as a Means to Control Micro Satellites with Extreme Precision*. AFIT/GAE/ENY/11-M32. Faculty Advisor: Lt Col Richard E. Huffman. Sponsor: AFRL/RZ.

YATES, MAX W., *Stochastic Orbit Prediction using KAM Tori*. AFIT/GA/ENY/11-M15. Faculty Advisor: Dr. William E. Wiesel. 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.

BLACK, JONATHAN T.,

Assistant Professor of Aerospace Engineering, Department of Aeronautics and Astronautics, AFIT
Appointment Date: 2007 (AFIT/ENY); BS Industrial Engineering, University of Illinois at Urbana-Champaign, 2001; MS Mechanical and Aerospace Engineering, Joint Institute for Advancement of Flight Sciences (joint NASA Langley Research Center and George Washington University program), 2003; PhD Mechanical Engineering, University of Kentucky, 2006. Dr. Black's research interests include lightweight and inflatable aerospace structures, structural and nonlinear dynamics, advanced sensing technologies, space systems engineering, and novel orbit analysis. His current work involves developing novel measurement and modeling techniques to characterize the static and dynamic behavior of new large lightweight space structures, micro UAV development, and research into enabling taskable satellites. He is the first AFIT recipient of an AFOSR Young Investigator Award and was recently named an AIAA Associate Fellow. Tel. 255-3636 x4578, email: Jonathan.Black@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

"Beamed Energy Propulsion Study LEO-GEO Tug." Sponsor: AFRL/RZ. Funding: \$70,000.

"Novel Multifunctional Imaging Chromotomographic Spectrometer Flight Experiment (CTEx)." Sponsor: AS&T. Funding: \$100,000 – Black 34%, Cobb 33%, Swenson 33%.

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

"OhioSAT Workshop." Sponsor: OAI. Funding: \$55,000.

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

REFEREED JOURNAL PUBLICATIONS

Swenson, E.D. and J.T. Black, "Measuring and Modeling 3D Mode Shapes of FalconSAT-5 Structural Engineering Model," *Journal of Experimental Mechanics*, Vol. 51, No. 6, July 2011, pp.933-945, DOI: 10.1007/s11340-010-9421-8.

Black, J.T., Cobb, R.C., Swenson, E.D., and B.J. Cooper, "Rigidizable Inflatable Get-Away-Special Experiment Space Flight Data Analysis," *Journal of Spacecraft and Rockets*, Vol. 48, No. 3, May – June 2011, pp. 447-487, DOI: 10.2514/1.50939.

Jennings, A., Black, J., Allen, C., Simpkins, J., and Sollars, R., "Vibrometer Steering System for Dynamic In-flight Tracking and Measurement," *Journal of Experimental Mechanics*, Vol. 51, No. 1, January 2011, pp. 71-84, DOI: 10.1007/s11340-010-9337-3.

Co, T.C., and Black, J.T., "A Taskable Space Vehicle: Realizing Cost Savings by Combining Orbital and Suborbital Flight," *Air and Space Power Journal*, Vol. 25, No. 2, June 2011, pp. 74-80.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Simmons, J., Black, J., and Moran, G., "A Survey of the Open Source Spaceflight Movement," AIAA Space 2011 Conference, Long Beach, CA, September 2011, AIAA Paper 2011-7225.

Simmons, J., and Black, J., "Verifying Launch Vehicle Conceptual Designs Using First Principles and Historical Trends," AIAA Space 2011 Conference, Long Beach, CA, September 2011, AIAA Paper 2011-7313.

Co, T.C., Zagaris, C., and Black, J.T., "Responsive Satellites through Ground Track Manipulation using Existing Technology," AIAA Space 2011 Conference, Long Beach, CA, September 2011, AIAA Paper 2011-7262. [ANT]

Jennings, A., Black, J., Allen, C., Pace, T., and Trinh, A., "Empirically Based Modeling of Tape Spring Hinge Deployment for Space Structures," AIAA Space 2011 Conference, Long Beach, CA, September 2011, AIAA Paper 2011-7249.

Stovall, A.M., Black, J.T., Jacques, D.R., and Engberg, B.S., "Satellite Risk Analysis Literature Review," AIAA Space 2011 Conference, Long Beach, CA, September 2011, AIAA Paper 2011-7187.

Niederhauser, J.D., and J.T. Black, "Characterization and Analysis for Flying COTS Electronics On-Orbit," 25th AIAA Utah State University Conference on Small Satellites, Logan, UT, August 2011, Paper SSC11-XII-3. [ANT]

Debes, J., Howard, N., Harrington, R., Cobb, R., and J. Black, "Rapid Build and Space Qualification of CubeSats," 25th AIAA Utah State University Conference on Small Satellites, Logan, UT, August 2011, Paper SSC11-VII-7. [ANT]

Ross, J.T., Risbeck, M.R., Simmons, R.J., Lofthouse, A.J., and J.T. Black, "Experimental Fin Tips For Reusable Launch Vehicles (ExFiT) Flight Data Validation," 52nd AIAA/ASME/ASCE/AHS/ASC Conference on Structures, Structural Dynamics and Materials, Denver, CO, April 2011, AIAA Paper 2011-2162.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

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

Space Systems Certificate Program, Chair.

52nd AIAA/ASME/ASCE/AHS/ASC Conference on Structures, Structural Dynamics and Materials, Structural Dynamics co-Technical Chair.

36th AIAA Dayton-Cincinnati Aerospace Sciences Symposium (DCASS) Technical Chair.

Reviewer, *AIAA Journal*, *AIAA Journal of Aircraft*, *AIAA Journal of Spacecraft and Rockets*, *Shock and Vibration*, *International Micro Air Vehicle Journal*, *Acta Astronautica*.

COBB, RICHARD G.,

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

SPONSOR FUNDED RESEARCH PROJECTS

“Hyperactive Fin.” Sponsor: 95 CPTS. Funding: \$10,921. [ANT]

“Dynamic Two-Way Time Transfer CubeSat Experiment.” Sponsor: AS&T. Funding: \$110,000 – Cobb 45%, Black 45%, Raquet 10%. [ANT]

“Dynamic Optimization for Rapid Route Planning and Analysis.” Sponsor: STRATCOM. Funding: \$75,000 – Cobb 50%, Jacques 50%.

“Space Tracking and Characterization Studies.” Sponsor: AFRL/RV. Funding: \$50,000.

“Dynamic Analysis of the Segmented Mirror Telescope.” Sponsor: NPS. Funding: \$62,500 – Cobb 40%, Black 30%, Swenson 30%.

REFEREED JOURNAL PUBLICATIONS

Black, J., Cobb, R., Swenson, E., and Cooper, B., “Rigidizable Inflatable Get-Away-Special Experiment Space Flight Data Analysis,” *AIAA Journal of Spacecraft and Rockets*, Vol. 48, No. 3, pp. 477-487, May 2011.

Shepherd, M. J., Cobb, R. G., Palazotto, A. N., and Baker, W. P., “Scaling Analyses for Large-Scale Space-Based Membrane Optics,” *AIAA Journal*, Vol. 49, No. 7, July 2011.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Jacques, D., Colombi, J., and Cobb R., “Fostering Systems Engineering Education through Interdisciplinary Programs and Graduate Capstone Projects,” 2011 ASEE Conference, Vancouver, Canada, June 2011.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Anderson, M. and Cobb, R., “Evaluation of Bi-harmonic Amplitude and Bias Modulation for Flapping Wing MAV Control,” Proceedings of the 49th AIAA Aerospace Sciences Meeting, Orlando, FL, January 2011, AIAA-2011-1161. [ANT]

Anderson, M., Sladek, N., and Cobb R., “Design, Fabrication, and Testing of an Insect-Sized MAV Wing Flapping Mechanism,” Proceedings of the 49th AIAA Aerospace Sciences Meeting, Orlando, FL, January 2011. [ANT]

Hutzel, J., Decker, D., Cobb, R., King, P., Veth, M., and J. Donbar, “Scramjet Isolator Shock Train Location Techniques,” 51st AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, 49th AIAA Aerospace Sciences Meeting, Orlando, FL, January 4-7, 2011.

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

GREENDYKE, ROBERT B.,

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

SPONSOR FUNDED RESEARCH PROJECTS

“Calculation of Hypersonic Heat Transfer Profiles.” Sponsor: NASIC. Funding: \$9,987.

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

“Improved Collision Modeling for Direct Simulation Monte Carlo Methods.” Sponsor: AFOSR. Funding: \$19,300.

“Modeling and Simulation of Ferroelectric Generation.” Sponsor: AMRDEC. Funding: \$20,000.

REFEREED JOURNAL PUBLICATIONS

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

Weaver, A.B., Alexeenko, A.A., Greendyke, R.B., Camberos, J.A., “Flowfield Uncertainty Analysis for Hypersonic CFD Simulations,” *Journal of Thermophysics and Heat Transfer*, Vol. 25 No. 1, January-March 2011.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Martin, C. and Greendyke, R., “Comparative Analysis of Coupled Radiation-Gasdynamic Solution Methodology,” Aerospace Sciences Meeting, Orlando FL Jan 2011.

Jelic, R., Sheerer, S., Greendyke, R., “Computation of Aerodynamic Flows over Bluff Bodies Using Overset-Grid Approach,” Aerospace Sciences Meeting, Orlando, FL Jan 2011.

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

HARMON, FREDERICK G., Lt Col,

Assistant Professor of Aeronautical Engineering, Department of Aeronautics and Astronautics, AFIT Appointment Date: 2008 (AFIT/ENY); BS, Electrical Engineering, Embry-Riddle Aeronautical University, 1992; MS, Electrical Engineering, Air Force Institute of Technology, 1996; PhD, Mechanical Engineering, University of California-Davis, 2005. Lt Col Harmon's research interests include the cooperative control of multiple unmanned aerial vehicles, autonomous vehicle guidance and control, bio-inspired control and technologies, nonlinear control, robotics, hybrid-electric propulsion systems, alternative energy systems, and fuel cell technology. His previous assignments were in research labs, intelligence organizations, and flight test squadrons. He has published several conference papers and journal articles as well as DOD publications. He is a member of AIAA, IEEE, and AUUSI. Tel. 937-255-3636 x7478 (DSN 785-3636, x7478), e-mail: Frederick.Harmon@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

“Parallel Hybrid-Electric Propulsion System for a Small Remotely Piloted Aircraft.” Sponsor: AFRL/RZ. Funding: \$20,000. [ANT]

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

SPONSOR FUNDED RESEARCH PROJECTS

“Radio Frequency Rocket Engine Plume Signatures (RFREPS).” Sponsor: AS&T. Funding: \$21,200.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

J. Hall, C. Hartsfield, J. Simmons, R. Branam, “Optimized Dual Expander Aerospike Nozzle Upper Stage Rocket Engine,” Jan 2011, Aerospace Sciences Meeting, Orlando FL.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

25 May 2011, Invited to present at the Missile Technology Control Regime course held by Defense Institute for Security Assistance Management, Washington Navy Yard, Washington DC.

26 July 2011, Invited to co-chair In Space Propulsion and Cryogenic Fluid Management session at NASA HBCU/OMI Collaborative Research Symposium at Cleveland State University.

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

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

SPONSOR FUNDED RESEARCH PROJECTS

“Plasma Actuator Diagnostics Development (PADD).” Sponsor: AFOSR. Funding: \$51,432.

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

“Aircraft Survivability.” Sponsor: STRATCOM. Funding: \$25,000.

SPONSOR FUNDED EDUCATIONAL PROJECTS

“Combat Aircraft Survivability Education.” Sponsor: OSD. Funding: \$34,500.

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

REFEREED JOURNAL PUBLICATIONS

Rutledge, J.L., King, P.I., Rivir, R., 2010, “Time Averaged Net Heat Flux Reduction for Unsteady Film Cooling,” *Journal of Engineering for Gas Turbines and Power*, Vol. 132.

Lyll, M.E., King, P.I., Sondergaard, R., Clark, J.P. and McQuilling, M.W., “An Investigation of Reynolds Lapse Rate for Highly Loaded Low Pressure Turbine Airfoils with Forward and Aft Loading,” accepted, *ASME Journal of Turbomachinery*, June 2011.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Rouser, K.P., King, P.I., Schauer, F.R., Hoke J.L., and Sondergaard, R., "Performance Evaluation of an Unsteady Turbine Driven by a Pulse Detonation Combustor," GT-2011-45396, ASME Turbo Expo 2011, Vancouver, BC, Canada, Jun 6-10, 2011.

Lyll, M.E., King, P.I., Sondergaard, R., Clark, J.P. and McQuilling, M.W., “An Investigation of Reynolds Lapse Rate for Highly Loaded Low Pressure Turbine Airfoils with Forward and Aft Loading” GT-2011-46328, ASME Turbo Expo 2011, Vancouver, BC, Canada, Jun 6-10, 2011.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Stevens, C.A., Gamezo, V.N., King, P.I., Schauer, F.R., and Hoke, J.L., “Interactions of Detonations with Ramps” AIAA 2011-0324, 49th AIAA Aerospace Sciences Meeting, Orlando, FL, Jan 4-7 2011.

Hutzel, J.R., Decker, D.D., Cobb, R.G. King, P.I. Veth, M.J., “Scramjet Isolator Shock Train Location Techniques,” AIAA-2011-0402, 49th AIAA Aerospace Sciences Meeting, Orlando, FL, Jan 4-7, 2011.

Johnson, J.J., King, P.I., Clark, J.P., Anthony, R.J., Koch, P.J., Ooten, M.K. and Kasik, E.A., “Three-Dimensional Film-Cooled Vane CFD Simulations and Preliminary Comparison to Experiments,” AIAA-2011-0499, 49th AIAA Aerospace Sciences Meeting, Orlando, FL, Jan 4-7, 2011.

Rouser, K.P., King, P.I., Schauer, F.R., Hoke J.L. and Sondergaard, R., “Time-Accurate Flow Field and Rotor Speed Measurements of a Pulsed Detonation Driven Turbine,” AIAA-2011-0577, 49th AIAA Aerospace Sciences Meeting, Orlando, FL, Jan 4-7, 2011.

Longo, N.C., King, P.I., Schauer, F.R., Sondergaard, R. and Hoke, J.L., “Heat Transfer Experiments on a Pulsed Detonation Driven Radial Turbine Exhaust,” AIAA-2011-0579, 49th AIAA Aerospace Sciences Meeting, Orlando, FL, Jan 4-7, 2011.

Nielsen, J.M., King, P.I., Schauer, F.R., Stevens, C.A., and Hoke, J.L., “Detonation Propagation through Ducts in a Pulsed Detonation Engine,” AIAA-2011-0585, 49th AIAA Aerospace Sciences Meeting, Orlando, FL, Jan 4-7, 2011

Hoeger, T.C., King P.I., Donbar, J.M. and Cox-Stouffer, S., "2-D Transient CFD Model of an Isolator Shock Train," AIAA-2011-2221, 17th AIAA Intl Space Planes and Hypersonic Sys and Tech Conf, San Francisco, CA, April 13-15, 2011.

KUNZ, DONALD L.,

Associate Professor of Aerospace Engineering, Department of Aeronautics and Astronautics, AFIT
Appointment Date: 2003 (AFIT/ENY); BS, Syracuse University, 1971; MS, Georgia Institute of Technology, 1972; PhD, Georgia Institute of Technology, 1976; Dr. Kunz's research interests include rotorcraft dynamics, vibrations, and loads, structural dynamics, aeroelasticity, multibody dynamics, smart structures, and computational structural mechanics. He has published more than 60 journal articles, conference papers, and technical reports. Prior to coming to AFIT, Dr. Kunz worked at the US Army Aeroflightdynamics Directorate, McDonnell Douglas Helicopter Company, Old Dominion University, and the US Army Aviation and Missile Command. He is an Associate Fellow of AIAA; a member of AHS and ASME; and a licensed professional engineer in the Commonwealth of Virginia. Tel. 937-255-3636 x4548 (DSN 785-3636 x4548), email: Donald.Kunz@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

"CH-47 Rotating System Fault Sensing for Condition Based Maintenance." Sponsor: AMCOM. Funding: \$42,872.

"Structural Dynamics of Membrane Structures Using Hamilton's Weak Principle." Sponsor: AFOSR. Funding: \$32,332.

"Research Support for Joint AFIT/TPS Test Management Projects." Sponsor: 95 CPTS. Funding: \$75,000.

REFEREED JOURNAL PUBLICATIONS

Schulz, C.S., Kunz, D.L., and Wereley, N.M., "Cramer-Rao Bound Development for Linear Time Periodic Systems," *ASME Journal of Dynamic Systems, Measurements and Control*, Vol. 133, No. 1, January 2011, 011001.

Boston, J.D., Swenson, E.D., Kunz, D.L., Yu, W., and Blair, M., "Experiments with Geometric Non-linear Coupling for Analytical Validation," *Journal of Aircraft*, Vol. 48, No. 4, July-August 2011, pp. 1136-1146.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Kim, T.H., Swenson, E.D., Kunz, D.L., Lindsley, N.J. and Blair, M., "Experimental Analysis of a Joined Wing Structure Subject to a Follower Force," AIAA/ASME/ASCE/AHS/ ASC 52nd Structures, Structural Dynamics and Materials Conference, Denver, Colorado, April 2011.

Kolsti, K.F. and Kunz, D.L., "A Simultaneous-Solution Space-Time Continuous Galerkin Method for Membrane Dynamics," AIAA/ASME/ASCE/AHS/ASC 52nd Structures, Structural Dynamics and Materials Conference, Denver, Colorado, April 2011.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Member, American Helicopter Society Education Committee.

Reviewer, *AIAA Journal*, *Journal of Aircraft*, *Shock and Vibration*.

Session Chair, 2011 Dayton-Cincinnati Aerospace Sciences Conference (Micro Air Vehicles I).

LIEBST, BRADLEY S.,

Professor of Aerospace Engineering and Head, Department of Aeronautics and Astronautics, AFIT
Appointment Date: 1989 (AFIT/ENY); BS, Wichita State University, 1978; MS, Massachusetts Institute of

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

LOFTHOUSE, ANDREW J., Maj,

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

SPONSOR FUNDED RESEARCH PROJECTS

“Nonequilibrium Gas Flows Using the Unified Flow Solver.” Sponsor: AFOSR. Funding: \$18,670.

“Repeatability of Store-Separation through Unsteady Flow.” Sponsor: AFSEO. Funding: \$2,500.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

J. Ross, M. Risback, R. Simmons, A. Lofthouse, J. Black, “Experimental Fin Tips for Reusable Launch Vehicles (ExFiT) Flight Data Validation,” AIAA Paper 2011-2162, 52nd AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics and Materials Conference, Denver, Colorado, April 2011.

N. Kraft, A. Lofthouse, “Non-Repeatability of Store Separation Trajectories from Internal Weapons Bays Due to Unsteady Cavity Flow Effects – Lessons Learned from a 2D Investigation,” AIAA Paper 2011-1238, 49th AIAA Aerospace Sciences Meeting, Orlando, Florida, January 2011.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Treasurer, AIAA Dayton-Cincinnati Section.

Reviewer, *Journal of Spacecraft and Rockets*, *Journal of Aerospace Engineering*, *Journal of Thermophysics and Heat Transfer*.

MALL, SHANKAR,

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

SPONSOR FUNDED RESEARCH PROJECTS

“Finite Element Modeling of Morphing Skin Concept.” Sponsor: AFRL/RB. Funding: \$8,000.

- “Carbon Nanotubes based Nanocomposites and Nanoadhesives for EMI/ESD Applications in Space Structures.” Sponsor: AS&T. Funding: \$86,719.
- “Carbon Nanotubes Based Conductors and Coax Cables for Applications in Space Structures.” Sponsor: AS&T. Funding: \$123,827.
- “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: \$34,980.
- “Improved Electromagnetic Hardening of Coax Cables and Composites Using Advanced Nanomaterials.” Sponsor: DAGSI. Funding: \$17,640.

REFEREED JOURNAL PUBLICATIONS

- Mall, S., Kim, H-K., Saladin, E.C. and Porter, W.J., “Effects of Microstructure on Fretting Fatigue Behavior of IN100,” *Materials Science and Engineering: A*, Vol. 527, 1453-1460, 2010.
- Sabelkin, V. and Mall, S., “Adhesive Elastic-Plastic Microcontact Analysis of Truncated Cylinder-on-Flat with Asperities,” *Journal of Adhesion Science and Technology*, Vol. 24, 407-427, 2010.
- Mall, S., Harder, B. T., Petrosky, J. C., Alexander, M. D., Hansen, G. and Hansen, N.D, “Investigation in Nickel Nanostrands based Nanocomposite for Space Applications,” *Journal of Hardened Electronic and Radiation Technology*, Vol. 28, 65-71, 2010.
- McGary, J., Petrosky, J. C., Mall, S., Farlow, G. and Hansen, N.D., “Measured Electrostatic Discharge Parameters for Nickel Nanostrands Based Nanocomposites for Space Applications,” *Journal of Hardened Electronic and Radiation Technology*, Vol. 28, 79-84, 2010.
- Gilbert, K. W., Mall, S., and Leedy, K. D., “Characterization of Gold-Gold Micro-Contact Behavior using a Nanoindenter based Method,” *Journal of Adhesion Science and Technology*, Vol. 24, 2597-2615, 2010.
- Mall, S., Kim, H-K., Porter, W.J., Ownby, J. F. and Traylor, A. G., “High Temperature Fretting Fatigue Behavior of IN100,” *International Journal of Fatigue*, Vol. 32, 1289-1298, 2010.
- Lee, H., and Mall, S., “Analysis of Fretting Fatigue of Cavitation Shotless Peened Ti-6Al-4V,” *Tribology Letters*, Vol. 38, 125-133, 2010.
- Mall, S. and Nye, A. R., “Fatigue Behavior of an Oxide/Oxide CMC under Combustion Environment,” *Ceramic Transactions*, Vol. 210, 2010.
- Mall, S., Harder, B. T., Petrosky, J. C., Hansen, G., Alexander, M. D. and Hansen, N.D, “Electromagnetic Interference and Electrical Conductivity Characteristics of Carbon/Polycyanate Composite with Nanostrands under Tensile Load,” *Polymer Composites*, Vol. 31, pp. 1343-1351, 2010.
- Rethinam, R. M., Yang, B., Mall, S. and Barsoum, M. W., “An Integral-Equation Formulation of Nonlinear Deformation in a Stack of Buffered Plates,” *Engineering Analysis with Boundary Elements*, Vol. 34, pp. 1113-1119, 2010.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

- Mall, S., Alexander, M. D., Rodriguez, J. and Harder, B. T., “Investigation into Electromagnetic Interference of a Nanocomposite under Monotonic Tension and Fatigue,” Proc. American Society for Composites, 2010, Dayton, OH.

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 over 201 archival technical publications and more than 460 technical presentations and manuscripts. Dr. Palazotto received the Hetanyi Award in 1982 from the Society of Experimental Mechanics, the Cleary Award in 1981 from the Air Force Materials Lab, the Structures and Materials Award from the ASCE in 1986 and the AIAA Sustained Service Award in 2004. Dr. Palazotto is a Fellow of the ASCE; a Fellow of the AIAA and a Fellow of the American Academy of Mechanics. He is a registered Professional Engineer in the state of Ohio. Tel. 937-255-3636 x4599 (DSN 785-3636 x4599), email: Anthony.Palazotto@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

"Structural Dynamic Characterization of a Biologically Inspired Micro Air Vehicle Wing." Sponsor: AFOSR. Funding: \$38,706.

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

REFEREED JOURNAL PUBLICATIONS

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

Piece, C., Palazotto, A., and Rosenberger, A., "Creep and Fatigue Interaction in the PWA 1484 Single Crystal Nickel base Alloy," *J. Material Science and Engineering*, A, Vol. 527, pp 7484-7489, 2010.

Sims, T., Palazotto, A., and Norris, A., "A Structural Dynamics Analysis of a Manduca Sexta Forewing," *Intl J. of Micro Air Vehicles*, Vol. 2, No. 3, pp 119-140, 2010.

Lodygowoski, A., Voyiadjis, G., and Palazotto, A., "Non-local Numerical Formulation for Dry Sliding Friction and Wear at High Velocities," *Intl. J. of Plasticity*, Vol. 27, pp 1004-1024, 2011.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Easterday, O., Palazotto, A., Branam, R., and, Baker, W., "Experimental Characterization of Damping Properties of Coatings at Elevated Temperatures" presented at the 52nd AIAA SDM Conference, Denver, CO., April, 4-7, 2011, paper # AIAA 2011-1943.

O'Hara, R., and Palazotto, A., "Structural Identification and Simulation of the Manduca Sexta," presented at the 52nd AIAA SDM Conference, Denver, CO., April, 4-7, 2011, paper # AIAA 2011-2066.

Palazotto, A., and Meador, S., "Consideration of Wear at High Velocities Using a Hydrocode," presented at the 52nd AIAA SDM Conference, Denver, CO., April, 4-7, 2011, paper # AIAA 2011-2120.

Abu Al-Rub, R., and Palazotto, A., "Nonlocal Constitutive Model for Simulating Localized Damage and Fracture Viscoplastic Solids Under Energy Impact," presented at the 52nd AIAA SDM Conference, Denver, CO., April, 4-7, 2011, paper # AIAA 2011-2175.

POLANKA, MARC D.,

Associate Professor of Aerospace Engineering, AFIT Appointment Date: 2009 (AFIT/ENY); BS, Mechanical Engineering, University of Dayton, 1992; MS, Mechanical Engineering, Stanford University,

1993; PhD, Mechanical Engineering, University of Texas, 1999; Prior to accepting a position with AFIT, Dr. Polanka served 17 years in Turbine Engine Division of the Air Force Research Laboratory's Propulsion Directorate. Dr. Polanka's research interests include aspects of heat transfer and fluid mechanics focusing on experimental applications involving turbine and combustor aerodynamics, heat loads, and cooling techniques. He has been published in a variety of journals including the Journal of Turbomachinery, the AIAA Journal of Propulsion and Power, and the Journal of Engineering for Gas Turbines and Power. He also has two patents to his credit. Dr. Polanka is an Associate Fellow of the AIAA, the current Section Chair of the Dayton-Cincinnati Section of the AIAA, and the Honors and Awards Chair for the same section. He is also a member of ASME and specifically the K-14 Committee of the International Gas Turbine Institute where is also a Vanguard Chair and the past Point Contact for the annual conference. Tel. 937-255-3636 x4714 (DSN 785-3636 x4714), email: Marc.Polanka@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

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

"Fundamental Issues in Integration of a UCC Combustor with a Turbine Vane." Sponsor: AFOSR. Funding: \$39,355 – Polanka 50%, Reeder 25%, Hartsfield 25%.

"Novel Laser-Based Diagnostics for Quantitative Characterization of Burning in the Turbine Phenomenon."
Sponsor: AFOSR. Funding: \$24,780.

REFEREED JOURNAL PUBLICATIONS

Polanka, M.D., Zelina, J., Anderson, W., Sekar, B., Evans, D.S., Lin, C.X., and Stouffer, S.D., "Heat Release in Turbine Film Cooling Part 1: Experimental and Computational Comparison of Three Geometries" *Journal of Propulsion and Power*, Vol. 27, March-April 2011, pg. 257-268.

Lin, C.X., Holder, R.J., Sekar, B., Zelina, J., Polanka, M.D., Thornburg, H.J., and Briones, A.M., "Heat Release in Turbine Film Cooling Part 2: Numerical Simulation of Shaped Hole Secondary Combustion Development and Location" *Journal of Propulsion and Power*, Vol. 27, March-April 2011, pg. 269-281.

Sanders, D.D., O'Brien, W.F., Sondergaard, R., Polanka, M.D., Rabe, D.C., "Predicting Separation and Transitional Flow in Turbine Blades at Low Reynolds Numbers - Part I: Development of Prediction Methodology" *Journal of Turbomachinery*, Vol. 133, July 2011, pg. 031011: 1-10.

Sanders, D.D., O'Brien, W.F., Sondergaard, R., Polanka, M.D., Rabe, D.C., "Predicting Separation and Transitional Flow in Turbine Blades at Low Reynolds Numbers - Part II: The Application to a Highly Separated Turbine Blade Cascade Geometry" *Journal of Turbomachinery*, Vol. 133, July 2011, pg. 031012: 1-7.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Bohan, B.T., and Polanka, M.D., "Analysis of Flow Migration in an Ultra-Compact Combustor," ASME Paper GT-2011-45916, IGTI Turbo Expo, Vancouver, Canada, Jun 6-10, 2011.

LeBay, K.D, Polanka, M.D., and Branam, R.D., "Characterizing the Effect of Radial Vane Height on Flame Migration in an Ultra Compact Combustor," GT-2011-45919, IGTI Turbo Expo, Vancouver, Canada, Jun 6-10, 2011.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

LeBay, K.D, Polanka, M.D., Reeder, M.F., and Branam, R.D., "Time-Resolved Particle Image Velocimetry Investigations within a Sectional Ultra Compact Combustor," AIAA 2010-895443, 47th AIAA Aerospace Sciences Meeting and Exhibit, Orlando, FL, Jan 3-7, 2011.

Benhassen, F., Polanka, M.D., and Reeder, M.F., "Time Resolved Filtered Rayleigh Scattering Measurement of a Buoyant Jet in a Co-flow," AIAA 2010-895843, 47th AIAA Aerospace Sciences Meeting and Exhibit, Orlando, FL, Jan 3-7, 2011.

Blunck, D., Kostka, S., Lynch, A., Polanka, M.D., Stouffer, S., Roy, S., Zelina, J., and Gord, J., "Flame Structure of Vitiated Fuel-rich Inverse Diffusion Flames in a Cross-Flow," 7th US National Combustion Meeting, Atlanta, GA, March 20-23, 2011.

Schmick, P.J., Crosbie, S.C., Polanka, M.D., Litke, P., and Hoke, J.L., "Development of a Small Internal Combustion Engine Altitude Test Chamber" AIAA-2011- , Joint Propulsion Conference, San Diego, CA, July 29-Aug 1, 2011.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Vanguard Chair for the Heat Transfer Committee of the International Gas Turbine Institute Turbo Expo '11, in Vancouver, Canada June 6-10, 2011.

Chair for the Dayton-Cincinnati Section of AIAA.

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

REEDER, MARK F.,

Associate Professor of Aerospace Engineering, AFIT Appointment Date: 2002 (AFIT/ENY); BS, Mechanical Engineering, West Virginia University, 1989; MS, Mechanical Engineering, Ohio State University, 1991; PhD, Mechanical Engineering, Ohio State University, 1994; Prior to accepting a position with AFIT, Dr. Reeder served as an NRC Research Associate at NASA Glenn and subsequently as the manager of Research and Development for a manufacturer of industrial mixing equipment. Dr. Reeder's research interests include all aspects of fluid mechanics with an emphasis on experimental applications involving external aerodynamics, mixing enhancement and propulsion. Publications include a characterization of store separation from a cavity using pressure sensitive paint and measurements of a micro air vehicle using a 6-DOF balance. He has been published in a variety of journals including the Journal of Fluid Mechanics, Experiments in Fluids, The AIAA Journal, The AIAA Journal of Propulsion and Power, Physics of Fluids, NASA Tech Briefs, and Chemical Engineering Progress. He has three patents to his credit and is a licensed Professional Engineer in the State of Ohio. Dr. Reeder is an Associate Fellow of the AIAA and a member of ASME. Tel. 937-255-3636 x4530 (DSN 785-3636 x4530), email: Mark.Reeder@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

"Experimental Study of Free-drop Store Separation from a Cavity at Mach 3." Sponsor: AFRL/RB. Funding: \$12,000.

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

"Design and Test of Flapping-Wing Micro Air Vehicles." Sponsor: AFRL/RB. Funding: \$60,000 – Reeder 33.3%, Cobb 33.3%, Black 33.3%. [ANT]

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, September 2011.

Reeder, M., Huffman, R., Branam, R., LeBay, K. and Meents, S., "Mixing of a gas-phase buoyant horizontal laminar jet measured with filtered Rayleigh scattering," *Experiments in Fluids*, Vol. 50, pp. 1455-1472, June 2011.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Love, B., Reeder, M., Schmit, R., Presdorf, T., "Time Resolved Filtered Rayleigh Scattering Measurement of a Buoyant Jet In a Co-flow" AIAA Paper 2011-0929, 49th AIAA Aerospace Sciences Meeting, Orlando, FL, January 2011.

Benhassen, F., Polanka, M., Reeder, M., "Time Resolved Filtered Rayleigh Scattering Measurement of a Buoyant Jet In a Co-flow" AIAA Paper 2011-1292, 49th AIAA Aerospace Sciences Meeting, Orlando, FL, January 2011.

LeBay, K., Polanka, M., Reeder, M., Branam, R., "Time Resolved Particle Image Velocimetry Investigations within a Sectional Ultra Compact Combustor" AIAA Paper 2011-0692, 49th AIAA Aerospace Sciences Meeting, Orlando, FL, January 2011.

Seney S., Huffman, R., Bailey, W., Liu, D., Reeder, M., Stults, J., "Experimental Study on the Induced Velocity of a Three Potential Sliding Discharge DBD Actuator," AIAA-2011-3732, 42nd AIAA Plasmadynamics and Lasers Conference in conjunction with the 18th International Conference on MHD Energy Conversion (ICMHD), Honolulu, Hawaii, June 27-30, 2011.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

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

Presented a keynote address entitled "USAF MAV Research Activities with a focus on Flapping Wing MAV Control" at IMAV 2011 (International Micro Air Vehicle Conference and Competition) in t'Harde, Netherlands, September 12-15, 2011.

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

Presented AIAA Paper 2011-0929 at the AIAA Annual Meeting (Orlando, FL, January 2011).

Served as Session Chair at the 49th AIAA Aerospace Sciences Meeting (Orlando, FL, January 2011).

Reviewer, *AIAA Journal of Aircraft*.

Served as an evaluator for proposals to the Army Research Office.

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

SPONSOR FUNDED RESEARCH PROJECTS

“Stressed Oxidation of Silicon Carbide (SiC).” Sponsor: AFRL/RX. Funding: \$10,000.

“Extension of the Viscoplasticity Theory Based on Overstress to Model Effects of Aging on Deformation Behavior of High-Temperature Polymers.” Sponsor: AFOSR. Funding: \$44,250.

“Biaxial Testing of Ceramic Matrix Composites (CMCs).” Sponsor: AFRL/RX. Funding: \$10,000.

REFEREED JOURNAL PUBLICATIONS

M. B. Ruggles-Wrenn, D. T. Christensen, A. L. Chamberlain, J. E. Lane, and T. S. Cook, “Effect of frequency and environment on fatigue behavior of a CVI SiC/SiC ceramic matrix composite at 1200 °C,” *Composites Science and Technology*, Vol. 71, No. 2, 2011, pp. 190-196.

M. B. Ruggles-Wrenn and B. A. Whiting, “Cyclic Creep and Recovery Behavior of Nextel™720/Alumina Ceramic Composite at 1200 °C,” *Materials Science and Engineering A*, Vol. 528, Oct 2010, pp. 1848-1856.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

J. Delapasse and M. B. Ruggles-Wrenn, “Fatigue Behavior of a Hi-Nicalon/SiC Ceramic Matrix Composite at 1200° C in Air and in Steam,” Proceedings of the 35th International Conference & Exposition on Advanced Ceramics & Composites, Daytona Beach FL, January 23–28, 2011.

C. J. Armani and M. B. Ruggles-Wrenn, “Creep Behavior of Nextel™610 and Nextel™720 Fiber Tows at Elevated Temperature,” Proceedings of the 35th International Conference & Exposition on Advanced Ceramics & Composites, Daytona Beach FL, January 23–28, 2011.

C. J. Armani and M. B. Ruggles-Wrenn, “Creep Performance of Polycrystalline YAG in Air and Steam Environments at Elevated Temperatures,” Proceedings of the 35th International Conference & Exposition on Advanced Ceramics & Composites, Daytona Beach FL, January 23–28, 2011.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

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

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

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

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

Composite Materials & Structures Symposium Organizer, ASME 2011 Pressure Vessel and Piping Conference, July 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), e-mail: James.Rutledge@us.af.mil

REFEREED JOURNAL PUBLICATIONS

Rutledge, J.L., King, P.I., Rivir, R., 2010, "Time Averaged Net Heat Flux Reduction for Unsteady Film Cooling," *Journal of Engineering for Gas Turbines and Power*, Vol. 132.

SIMMONS, RONALD J., Lt Col,

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

SWENSON, ERIC D.,

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

SPONSOR FUNDED RESEARCH PROJECTS

"Experimental Validation of the Geometrically-Exact Beam Theory (GEBT)." Sponsor: AFRL/RB. Funding: \$12,000.

"AFRL/RV-AFIT 2011 MOA Research." Sponsor: AFRL/RV. Funding: \$47,500.

"Dynamic Responsive Orbital Networking Experimental Satellite (DRONES) Engineering Model Research." Sponsor: SMC. Funding: \$7,000 – Swenson 90%, Black 10%.

"Falcon-Sat-7 Engineering Model Research." Sponsor: USAFA. Funding: \$10,000 – Swenson 90%, Black 10%.

REFEREED JOURNAL PUBLICATIONS

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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

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Torvik, Peter. J., "On Estimating System Damping from Frequency Response Bandwidths," in *Journal of Sound and Vibration*, Volume 330, pp 6088-6097, 2011.

Filippi, S., and P. J. Torvik, "A Methodology for Predicting the Response of Blades with Nonlinear Coatings," *Journal of Engineering for Gas Turbines and Power* (ASME), Vol. 133, No. 4, 042503,(7 pages), April, 2011.

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Torvik, P. J., "Material and Slip Damping," Chapter 35, *Shock and Vibration Handbook*, 6th Edition, Eds. A. G. Piersol and T. Paez, McGraw Hill (35 pages), 2010.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Consultant (through Universal Technology Corporation) to Propulsion Directorate, Air Force Materials Laboratory and APS Materials, Inc.

Member, Board of Directors, Honor Seminars of Metropolitan Dayton.

Member, Editorial Board, International Journal of Turbo and Jet Engines.

Reviewer, *Applied Acoustics*, ASME Turbo Expo 2011.

WIESEL, WILLIAM E., Jr.,

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REFEREED JOURNAL PUBLICATIONS

Bordner, R.E. III and Wiesel, W.E., "Spectral Decomposition of Orbital Tori," *J. Guidance, Control and Dynamics*, 34, 504-512, 2011.

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Bordner, R.E. III and Wiesel, W.E., "Spectral Decomposition of Orbital Tori," AAS/AIAA Spaceflight Mechanics Meeting. Feb. 13-17, 2011, New Orleans, LA.

Frey, Gregory, and Wiesel, W.E., "KAM Torus Frequency Generation from Two-Line Element Sets," Advanced Maui Optical and Space Surveillance Technologies Conference, Maui, Hi, Sept 13-16, 2011.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Secretary, Board of Directors, Honors Seminars of Metropolitan Dayton, Inc.

5.2. DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

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5.2.1. DOCTORAL DISSERTATIONS

- CLARK, JEFFREY D., *Distributed Spacing Stochastic Feature Selection and its Application to Textile Classification*. AFIT/DEE/ENG/11-05. Faculty Advisor: Maj Michael J. Mendenhall. Sponsor: AFRL/RV.
- CROSSLEY, BENJAMIN L., *Carbon Nanotube Field Emission Arrays*. AFIT/DCE/ENG/11-03. Faculty Advisor: Dr. Ronald A. Coutu, Jr. Sponsor: N/A.
- DUBE, THOMAS E., *A Novel Malware Target Recognition Architecture for Enhanced Cyberspace Situation Awareness*. AFIT/DCE/ENG/11-07. Faculty Advisor: Dr. Richard A. Raines. Sponsor: N/A. [CCR]
- ELLIS, TROY R., *Shack-Hartmann and Interferometric Hybrid Wavefront Sensor*. AFIT/DEO/ENG/11-01. Faculty Advisor: Maj Jason D. Schmidt. Sponsor: AFOSR.
- FADUL, JOSE E., *Using Reputation Based Trust to Overcome Malfunctions and Malicious Failures in Electric Power Protection Systems*. AFIT/DEE/ENG/11-08. Faculty Advisor: Dr. Kenneth M. Hopkinson. Sponsor: AFOSR. [ANT]
- FULLER, DANE F., *Phase History Decomposition for Efficient Scatterer Classification in SAR Imagery*. AFIT/DEE/ENG/11-09. Faculty Advisor: Maj Michael A. Saville. Sponsor: N/A.
- MORRISON, JAMIE R., *Vision Aided Inertial Navigation System Augmented with a Coded Aperture*. AFIT/DCE/ENG/10-14. Faculty Advisor: Dr. John F. Raquet. Sponsor: AFRL/RV. [ANT]
- SECREST, BARRY R., *A Linear Combination of Heuristics Approach to Spatial Sampling Hyperspectral Data for Target Tracking*. AFIT/DEE/ENG/10-08. Faculty Advisor: Maj Michael J. Mendenhall. Sponsor: AFRL/RV. [ANT]
- TELLEZ, JASON A., *Integrated Approach to Free Space Optical Communications in Strong Turbulence*. AFIT/DEE/ENG/11-11. Faculty Advisor: Maj Jason D. Schmidt. Sponsor: AFOSR.
- WHEELER, DANIEL J., *Modeling Self-Referencing Interferometers with Extended Beacons and Strong Turbulence*. AFIT/DEO/ENG/11-12. Faculty Advisor: Maj Jason D. Schmidt. Sponsor: AFOSR.
- YARBROUGH, ALLAN W., *Hyperspectral-Based Adaptive Matched Filter Detector Error as a Function of Atmospheric Profile Estimation*. AFIT/DEE/ENG/11-13. Faculty Advisor: Maj Michael J. Mendenhall. Sponsor: AFRL/RV.

5.2.2. MASTER'S THESES

- ATIENZA, DANIEL V., *Characterization of Noise Technology Radar Signal Detectability Using a Non-Cooperative Receiver*. AFIT/GE/ENG/11-01. Faculty Advisor: Dr. Michael A. Temple. Sponsor: AFRL/RV.
- BARES, DAVID C., *Satellite Security: Obfuscating Command Link Messages*. AFIT/GCO/ENG/11-01. Faculty Advisor: Maj Eric M. Trias. Sponsor: AFOSR. [CCR]
- BEICH, JONATHAN W., *Vision-Aided Autonomous Precision Weapon Terminal Guidance Using a Tightly-Coupled INS and Predictive Rendering Techniques*. AFIT/GE/ENG/11-42. Faculty Advisor: Lt Col Michael J. Veth. Sponsor: Draper Laboratory. [ANT]
- BOCHERT, JOHN R., *Software and Critical Technology Protection Against Side Channel Analysis through Dynamic Hardware Obfuscation*. AFIT/GCE/ENG/11-01. Faculty Advisor: Dr. Yong C. Kim. Sponsor: AFOSR.

BOND, ROBERT M., *Emerging Threat Detection Methods for GPS C/A Code Receivers*. AFIT/GE/ENG/11-02. Faculty Advisor: Dr. John F. Raquet. Sponsor: SMC. [ANT]

CAGURANGAN, ERIC T., *Using an Intrusion Detection System to Protect Flight Control Software*. AFIT/GCS/ENG/11-01. Faculty Advisor: Lt Col Jeffrey W. Humphries. Sponsor: N/A. [CCR]

CHICK, DAVID F., *Direction Finding with Mutually Orthogonal Antennas*. AFIT/GE/ENG/11-03. Faculty Advisor: Dr. Andrew J. Terzuoli. Sponsor: AFRL/RV.

CHRISTEL, BRADY T., *Two Dimensional Positioning and Heading Solution for Flying Vehicles Using a Line-Scanning Laser Radar (LADAR)*. AFIT/GE/ENG/11-04. Faculty Advisor: Lt Col Michael J. Stepaniak. Sponsor: N/A. [ANT]

CLIMER, JONATHON R., *Overcoming Pose Limitations of a Skin-Cued Histograms of Oriented Gradients Dismount Detector through Contextual Use of Skin Islands and Multiple Support Vector Machines*. AFIT/GE/ENG/11-05. Faculty Advisor: Maj Michael J. Mendenhall. Sponsor: 711 HPW/RH. [ANT]

COERBELL, MARLON, *Creating a Network Model for the Integration of Dynamic and Static Supervisory Control and Data Acquisition (SCADA) Test Environment*. AFIT/GCO/ENG/11-02. Faculty Advisor: Dr. Kenneth M. Hopkinson. Sponsor: AFOSR.

COOPER, CHRISTOPHER M., *A Framework for the Management of Simulated Behavior Performance*. AFIT/GCE/ENG/11-02. Faculty Advisor: Lt Col Brett J. Borghetti. Sponsor: 711 HPW/RH. [ANT]

CORBIN, CLAIR F., *High Frequency Direction Finding Using Structurally Integrated Antennas on a Large Airborne Platform*. AFIT/GE/ENG/11-06. Faculty Advisor: Maj Geoffrey A. Akers. Sponsor: AFRL/RV.

CROZIER, STANLEY D., *Development of an Interference Lithography Capability Using a Helium Cadmium Ultraviolet Multimode Laser for the Fabrication of Sub-Micron-Structured Optical Materials*. AFIT/GE/ENG/11-07. Faculty Advisor: Dr. Michael M. Marciniak. Sponsor: AFRL/RX. [CDE]

DENNISON, JEFFERY S., *Simulating the Effects of an Extended Source on the Shack-Hartmann Wavefront Sensor through Turbulence*. AFIT/GE/ENG/11-08. Faculty Advisor: Maj Jason D. Schmidt. Sponsor: AFRL/RD.

DOLCE, PAUL F., *A Statistical Approach to Fusing 2-D and 3-D LADAR Systems*. AFIT/GE/ENG/11-09. Faculty Advisor: Dr. Stephen C. Cain. Sponsor: AFRL/RW.

DUNCAN, MARK C., *Trust Management and Security in Satellite Telecommand Processing*. AFIT/GCO/ENG/11-03. Faculty Advisor: Dr. Kenneth M. Hopkinson. Sponsor: AFOSR. [ANT]

ENGELSON, KURTIS G., *Three Channel Polarimetric Based Data Deconvolution*. AFIT/GE/ENG/11-10. Faculty Advisor: Dr. Stephen C. Cain. Sponsor: AFRL/RD.

FALKINBURG, JEFFREY L., *Dynamic Polymorphic Reconfiguration to Effectively "CLOAK" a Circuit's Function*. AFIT/GCE/ENG/11-03. Faculty Advisor: Dr. Yong C. Kim. Sponsor: AFOSR.

FRYER, BRYON K., *Virtual Battlespace Behavior Generation through Class Imitation*. AFIT/GCO/ENG/11-04. Faculty Advisor: Lt Col Brett J. Borghetti. Sponsor: AFRL/RV.

GARCIA, ERIC W., *Evaluation of the Single Keybit Template Attack*. AFIT/GE/ENG/11-11. Faculty Advisor: Dr. Rusty O. Baldwin. Sponsor: NSA. [CCR]

GETZ, THOMAS B., *Radiation Induced Fault Detection, Diagnosis, and Characterization of Field Programmable Gate Arrays*. AFIT/GE/ENG/11-12. Faculty Advisor: Dr. Yong C. Kim. Sponsor: AFOSR.

GREVE, GABRIEL H., *Network Security Toolkit Including Heuristic Solutions for Trust System Placement and Network Obfuscation*. AFIT/GCS/ENG/10-08. Faculty Advisor: Dr. Kenneth M. Hopkinson. Sponsor: AFOSR. [ANT]

HAMILTON, NICOLAS S., *Long Term Quadrotor Stabilization*. AFIT/GE/ENG/11-13. Faculty Advisor: Lt Col Michael J. Stepaniak. Sponsor: N/A. [ANT]

HANCOCK, DAVID, *A Multi Agent System for Flow-Based Intrusion Detection Using Reputation and Evolutionary Computation*. AFIT/GCS/ENG/11-02. Faculty Advisor: Dr. Gary B. Lamont. Sponsor: AFRL/RV. [ANT]

HARDY, TYLER J., *Malicious and Malfunctioning Node Detection via Observed Physical Layer Data*. AFIT/GE/ENG/11-14. Faculty Advisor: Dr. Richard K. Martin. Sponsor: AFRL/RV.

HAUGHT, JAMES D., *Adaptive Quality of Service Engine with Dynamic Queue Control*. AFIT/GCC/ENG/11-03. Faculty Advisor: Dr. Kenneth M. Hopkinson. Sponsor: AFOSR.

HENRY, WAYNE C., *Covert Channels within IRC*. AFIT/GCE/ENG/11-04. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: 688 IOW. [CCR]

HOWARD, CARL N., *Initial Design and Development of an Extended Feature Colony I CubeSat Bus*. AFIT/GE/ENG/11-15. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: N/A. [ANT]

HOWARD, JAMES M., *Image Dependent Relative Formation Navigation for Autonomous Aerial Refueling*. AFIT/GE/ENG/11-16. Faculty Advisor: Lt Col Michael J. Veth. Sponsor: AFRL/RV. [ANT]

HUBER, KEVIN E., *Host-Based Systemic Network Obfuscation System for Windows*. AFIT/GCO/ENG/11-05. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: N/A. [CCR]

HURD, EDWARD J., *Characteristics of a High Intensity, Pulsed, Potassium Vapor Laser in a Heat Pipe*. AFIT/GE/ENG/11-17. Faculty Advisor: Lt Col Jeremy C. Holtgrave. Sponsor: HELJTO. [CDE]

JL, JENNY W., *Holistic Network Defense: Fusing Host and Network Features for Attack Classification*. AFIT/GE/ENG/11-18. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: AFRL/RI. [ANT]

JOHNSON, JEREMIAH D., *Polarimetric Enhancements to Electro-Optical Aided Navigation Techniques*. AFIT/GE/ENG/11-19. Faculty Advisor: Lt Col Jeremy C. Holtgrave. Sponsor: AFOSR. [ANT]

JUSSAUME, MATTHEW E., *Electromagnetic Modeling and Measurement of Adaptive Metamaterial Structural Elements*. AFIT/GE/ENG/11-20. Faculty Advisor: Dr. Peter J. Collins. Sponsor: AFRL/RX.

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KO, HYUNCHUL, *Combinational Circuit Obfuscation through Power Signature Manipulation*. AFIT/GCS/ENG/11-05. Faculty Advisor: Dr. Yong C. Kim. Sponsor: AFOSR.

KOCH, BRADLEY M., *A Multispectral Bidirectional Reflectance Distribution Function Study of Human Skin for Improved Dismount Detection*. AFIT/GE/ENG/11-22. Faculty Advisor: Maj Michael J. Mendenhall. Sponsor: 711 HPW/RH. [ANT]

KRUG, MICHELLE C., *Insider Threat Detection Using Microsoft Event Viewer Log Files*. AFIT/GCO/ENG/10-19. Faculty Advisor: Dr. Rusty O. Baldwin. Sponsor: N/A. [CCR]

KUHAR, BENJAMIN B., *Twitter Malware Collection System: An Automated URL Extraction and Examination Platform*. AFIT/GCO/ENG/11-07. Faculty Advisor: Dr. Rusty O. Baldwin. Sponsor: N/A. [CCR]

LEE, SPENSER D., *Routing UAVs to Co-Optimize Mission Effectiveness and Network Performance with Dynamic Programming*. AFIT/GCS/ENG/11-04. Faculty Advisor: Dr. Kenneth M. Hopkinson. Sponsor: AFRL/RX. [ANT]

LICHTFUSS, ERICH H., *Non-GPS Navigation Using Vision-Aiding and Active Radio Range Measurements*. AFIT/GE/ENG/11-23. Faculty Advisor: Lt Col Michael J. Veth. Sponsor: Raytheon. [ANT]

LIEVSAY, JAMES R., *Simultaneous Range/Velocity Detection with an Ultra-Wideband Random Noise Radar through Fully Digital Cross-Correlation in the Time Domain*. AFIT/GE/ENG/11-24. Faculty Advisor: Maj Geoffrey A. Akers. Sponsor: AFRL/RX.

LOMBARDI, JACK P., *Optical Metamaterial Design, Fabrication and Test*. AFIT/GCE/ENG/11-25. Faculty Advisor: Dr. Ronald A. Coutu. Sponsor: AFRL/RX.

LUSTIC, KEVIN C., *Performance Analysis and Optimization of the Winnow Secret Key Reconciliation Protocol*. AFIT/GCO/ENG/11-08. Faculty Advisor: Lt Col Jeffrey W. Humphries. Sponsor: N/A. [CCR]

MACMANUS, QUENTIN D., *Blind Deconvolution Method of Image Deblurring Using Convergence of Variance*. AFIT/GE/ENG/11-26. Faculty Advisor: Dr. Richard K. Martin. Sponsor: AFRL/RD.

MAIER, MATTHEW J., *Estimating Anthropometric Marker Locations from 3-D LADAR Point Clouds*. AFIT/GE/ENG/11-27. Faculty Advisor: Maj Michael J. Mendenhall. Sponsor: 711 HPW/RH. [ANT]

MCGEE, MILES E., *Critical Information Technology on FPGAs through Unique Device Specific Keys*. AFIT/GCE/ENG/11-10. Faculty Advisor: Dr. Yong C. Kim. Sponsor: AFOSR.

MCGUIGAN, RUSSEL J., *Effect of Coudé Pupil Rotation on Sodium Laser Beacon Perspective Elongation*. AFIT/GE/ENG/11-28. Faculty Advisor: Maj Jason D. Schmidt. Sponsor: AFRL/RD.

MERRIT, DAVID T., *Spear Phishing Attack Detection*. AFIT/GCE/ENG/11-05. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: 688 IOW. [CCR]

MILLER, JAMES L., *An Architecture for Improving Timeliness and Relevance of Cyber Incident Notifications*. AFIT/GCO/ENG/11-09. Faculty Advisor: Dr. Robert F. Mills. Sponsor: 711 HPW/RH. [CCR]

MOON, STEPHEN M., *RVUMS Antenna Modeling and Simulation for Identification and Mitigation of Ring-down*. AFIT/GE/ENG/11-29. Faculty Advisor: Dr. Peter J. Collins. Sponsor: AFMC/781 TS.

NIELSEN, JASON R., *Evaluating Information Assurance Control Effectiveness on an Air Force Supervisory Control and Data Acquisition (SCADA) System*. AFIT/GCO/ENG/11-10. Faculty Advisor: Maj Jeffrey M. Hemmes. Sponsor: N/A. [CCR]

NOEL, WILFRED E., *Signals of Opportunity Navigation Using Wi-Fi Signals*. AFIT/GCE/ENG/11-30. Faculty Advisor: Maj Kenneth A. Fisher. Sponsor: AFRL/RX. [ANT]

OLNEY, THOMAS S., *A Simple Non-Destructive Method for Characterizing Non-Dispersive, Low-Loss Dielectrics*. AFIT/GE/ENG/11-31. Faculty Advisor: Dr. Michael J. Havrilla. Sponsor: AFRL/RX.

OSTLER, RYAN T., *Defensive Cyber Battle Damage Assessment through Attack Methodology Modeling*. AFIT/GCO/ENG/11-11. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: N/A. [CCR]

OSTROW, SCOTT A., *Microelectromechanical Systems (MEMS) Designs for Anti-Tamper Response Applications*. AFIT/GE/ENG/11-32. Faculty Advisor: Dr. Ronald A. Coutu. Sponsor: AFRL/R.Y.

OWEN, TOMAS G., *Evaluation of the Effectiveness of Various Protection Mechanisms against Smart Card-Borne Threats*. AFIT/GCO/ENG/11-12. Faculty Advisor: Lt Col Jeffrey W. Humphries. Sponsor: N/A. [CCR]

PRAHL, DAYVID, *Coupling Vanishing Point Tracking with Inertial Navigation to Estimate Attitude in a Structured Environment*. AFIT/GE/ENG/11-33. Faculty Advisor: Lt Col Michael J. Veth. Sponsor: AFRL/R.Y. [ANT]

PRIESTLY, JOHN A., *AFIT NoNET Enhancements: Software Model Development and Optimization of Signal Processing Architecture*. AFIT/GE/ENG/11-34. Faculty Advisor: Dr. Peter J. Collins. Sponsor: AFRL/R.Y.

RICE, ANDREW C., *Context Aided Tracking with Adaptive Hyperspectral Imagery*. AFIT/GE/ENG/11-43. Faculty Advisor: Dr. Juan R. Vasquez. Sponsor: AFRL/R.Y. [ANT]

RONDEAU, CHRISTOPHER M., *Navigation with Limited Prior Information Using Time Difference of Arrival Measurements from Signals of Opportunity*. AFIT/GE/ENG/10-32. Faculty Advisor: Dr. Richard K. Martin. Sponsor: AFRL/R.Y. [ANT]

SCHOCKLING, MINDY K., *Zero-Knowledge Authentication in Mobile Ad Hoc Networks*. AFIT/GCO/ENG/11-13. Faculty Advisor: Dr. Rusty O. Baldwin. Sponsor: AFRL/RI. [CCR]

SCOTT, AMBER L., *Effects of Cyclic Prefix Jamming Versus Noise Jamming in OFDM Signals*. AFIT/GE/ENG/11-35. Faculty Advisor: Dr. Richard K. Martin. Sponsor: AFRL/R.Y. [ANT]

SCOTT, JEFFREY B., *Automated Analysis of ARM Binaries Using the Low-Level Virtual Machine Compiler Framework*. AFIT/GCO/ENG/11-14. Faculty Advisor: Dr. Rusty O. Baldwin. Sponsor: N/A. [CCR]

SONG, MUJUN, *Characterizing Cyclostationary Features of Digital Modulated Signals with Empirical Measurements Using Spectral Correlation Function*. AFIT/GCE/ENG/11-09. Faculty Advisor: Maj Ryan W. Thomas. Sponsor: ONR.

STANGE, JACOB M., *Authentication Theft: An Attack on .NET Smart Cards*. AFIT/GCO/ENG/11-15. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: N/A. [CCR]

STANTON, WILLIAM E., *Improved Key Generation Method Using Field Programmable Gate Arrays*. AFIT/GE/ENG/11-37. Faculty Advisor: Dr. Yong C. Kim. Sponsor: AFRL/R.Y.

STUECKLE, JONATHAN D., *Android Protection System: A Signed Code Security Mechanism for Smartphone Applications*. AFIT/GCE/ENG/11-06. Faculty Advisor: Dr. Rusty O. Baldwin. Sponsor: NSA. [CCR]

SUTARA, STEPHEN J., *Experimental Investigation into the Radar Cross Section of the Gridded Square Trihedral*. AFIT/GE/ENG/11-38. Faculty Advisor: Maj Michael A. Saville. Sponsor: N/A.

TEMPELIS, ANDREAS X., *Bistatic 3D Electromagnetic Scattering from a Right-Angle Dihedral at Arbitrary Orientation and Position*. AFIT/GE/ENG/11-39. Faculty Advisor: Dr. Julie A. Jackson. Sponsor: N/A.

TREJO, ROBERTO A., *Environment Condition Detection Using Field Programmable Gate Arrays*. AFIT/GCE/ENG/11-07. Faculty Advisor: Dr. Yong C. Kim. Sponsor: AFRL/R.Y.

WAGONER, LAUREN M., *Detecting Man-in-the-Middle Attacks against Transport Layer Security Connections with Timing Analysis*. AFIT/GCO/ENG/11-16. Faculty Advisor: Lt Col Jeffrey W. Humphries. Sponsor: N/A. [CCR]

WEEMS, MARK A., *Kernelized Locality-Sensitive Hashing for Fast Image Landmark Association*. AFIT/GE/ENG/11-40. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: AFRL/R.Y. [ANT]

WEYERS, CHRISTOPHER P., *Multiple Integrated Navigation Sensors for Improving Occupancy Grid FastSLAM*. AFIT/GCE/ENG/11-08. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: AFRL/R.Y. [ANT]

WILLIAMS, MCKAY D., *Application of RF-DNA Fingerprinting to Improve WiMAX Security*. AFIT/GE/ENG/11-41. Faculty Advisor: Dr. Michael A. Temple. Sponsor: AFRL/R.Y. [CCR]

WOOLINGHAM, MICHAEL R., *Detecting Insider Threats on a Cisco Router Using the Native Functionality of the Internetwork Operating System*. AFIT/GCO/ENG/11-17. Faculty Advisor: Dr. Robert F. Mills. Sponsor: NSA. [CCR]

5.2.3. GRADUATE RESEARCH PAPERS

BARCOMB, KRIS E., *Taking the High Ground: A Case for Department of Defense Application of Public Cloud Computing*. AFIT/ICW/ENG/11-01. Faculty Advisor: Dr. Robert F. Mills. Sponsor: N/A. [CCR]

BISHOP, BENJAMIN W., *An Assessment of Napoleonic Command and Control Principles in Air Force Network Defense Operations*. AFIT/ICW/ENG/11-02. Faculty Advisor: Capt Jonathan W. Butts. Sponsor: 561 NOS. [CCR]

ECKBERG, JASON A., *Cognitive Electronic Warfare: A Model for Future Electronic Warfare Systems*. AFIT/ICW/ENG/11-03. Faculty Advisor: Lt Col Michael J. Stepaniak. Sponsor: AFRL/R.Y. [ANT]

FRAMPTON, JONATHAN J., *Achieving National Unity of Effort in Cyber*. AFIT/ICW/ENG/11-04. Faculty Advisor: Dr. Michael R. Grimaila. Sponsor: N/A. [CCR]

HAMMOND, CHRISTOPHER B., *Integration of Cyberspace Operations and Conventional Kinetic Air Operations*. AFIT/ICW/ENG/11-05. Faculty Advisor: Lt Col David J. Robinson. Sponsor: N/A. [CCR]

KRILL, DENNIS J., *Re-integrating Influence and Cyber Operations*. AFIT/ICW/ENG/11-06. Faculty Advisor: Dr. Michael R. Grimaila. Sponsor: NASIC.

LAVINE, DAVID A., *Leveraging ITIL/ITSM into Network Operations*. AFIT/ICW/ENG/11-07. Faculty Advisor: Capt Jonathan W. Butts. Sponsor: 561 NOS. [CCR]

MARTINO, RICHARD A., *Leveraging Traditional Battle Damage Assessment Procedures to Measure Effects from a Computer Network Attack*. AFIT/ICW/ENG/11-08. Faculty Advisor: Dr. Robert F. Mills. Sponsor: NASIC. [CCR]

MCCALLIE, DONALD L., *Exploring Potential ADS-B Vulnerabilities in the FAA's NextGen Air Transportation System*. AFIT/ICW/ENG/11-09. Faculty Advisor: Capt Jonathan W. Butts. Sponsor: N/A. [CCR]

MYERS, MICHAEL J., *Emerging Roles of Combat Communication Units in Cyber Warfare as Related to Computer Network Attack, Defense and Exploitation*. AFIT/ICW/ENG/11-10. Faculty Advisor: Dr. Michael R. Grimaila. Sponsor: 689 CCW. [CCR]

NELSON, ALEXANDER D., *Patching the Wetware: Addressing the Human Factor in Information Security*. AFIT/ENG/ICW/011-11. Faculty Advisor: Dr. Robert F. Mills. Sponsor: N/A. [CCR]

TERRY, KATRINA A., *Overcoming the Support Focus of the 17D Cyberspace Operations Career Field*.
AFIT/ICW/ENG/11-12. Faculty Advisor: Dr. Robert F. Mills. Sponsor: SAF/A60. [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,

Assistant Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT
Appointment Date: 2009 (AFIT/ENG), BS, Electrical Engineering, Missouri University of Science and Technology, 1996; MS, Electrical Engineering, Air Force Institute of Technology, 2000; PhD, University of Kansas. His research interests include space-time adaptive processing, synthetic aperture radar, noise radar technology, digital beamforming, and direction finding. Tel. 937-255-3636 x4659 (DSN 785-3636 x4659), email: Geoffrey.Akers@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

“RF Modeling.” Sponsor: AFRL/RY. Funding: \$39,000.

“Radio Frequency Waveform Exploitation.” Sponsor: NSA. Funding: \$50,000 – Akers 46%, Jackson 46%, Terzuoli 8%. [CCR]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

G. Akers and J. Lievsay, “Experimental Results of Simultaneous Range/Velocity Detection Using Random Noise Radar Signals,” Tri-Service Radar Symposium, June 2011, 9 pages.

J. Lievsay and G. Akers, “Moving Target Detection via 2D Digital Time-Domain Correlation of Random Noise Radar Signals,” IEEE Radar Conference, ISBN 978-1-4244-8900-8, pp 784-788, May 2011.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

T. Thorson and G. Akers, “Investigating the Use of a Binary ADC for Simultaneous Range and Velocity Processing in a Random Noise Radar,” National Aerospace & Electronics Conference, July 2011, 6 pages.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Conference session chair at *The IEEE Radar Conference*, Kansas City, MO, May 2011.

Conference session co-chair at *The Tri-Service Radar Symposium*, Monterey, CA, June 2011.

Elected to the grade of Senior Member, IEEE, June 2011.

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 on field programmable gate arrays. Tel. 937-255-3636 x4901 (DSN 785-3636 x4901), email: Todd.Andel@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

“Using Formal Methods to Analyze Network Security Properties.” Sponsor: AFOSR. Funding: \$37,819.

REFEREED JOURNAL PUBLICATIONS

Kyle E. Stewart, Jeffrey W. Humphries, and Todd R. Andel, "An Automated Virtualization Performance Analysis Platform," *Journal of Defense Modeling and Simulation: Cyber Defense - Methodologies and Techniques for Evaluation*, 10 January 2011, 9 pages, DOI: 10.1177/1548512910391828.

B.W. Ramsey, B.E. Mullins, R.W. Thomas, and T.R. Andel, "Subjective audio quality over a secure IEEE 802.11 network," *International Journal of Security and Networks*, Vol. 6, No. 1, 1st Qtr 2011, pp 53-63.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Kyle E. Stewart, Todd R Andel, and Jeffrey W. Humphries, "Measuring the Performance of Network Virtualization Tool N2N in the Design of a Cyber Warfare Training and Education Platform," In *Proceedings of 2011 Spring Simulation Multi-conference (SpringSim11)*, Boston, MA, 4-7 April 2011, pp. 28-35.

Jose Fadul, Kenneth Hopkinson, Christopher Sheffield, James Moore, and Todd Andel, "Trust Management and Security in the Future Communication-Based "Smart" Electric Power Grid," in 44th Hawaii International Conference on System Sciences (HICSS), Kauai, Hawaii, 4-7 Jan 2011, pp. 1-10.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

June 2011. Appointed to the Federal Voting Assistance Program (FVAP) Cyber Security Review Group to provide recommendations as they develop electronic voting options for overseas voters as directed by the 2002/2005 NDAA. This group is comprised of 20 top federal employees with leadership/influence within the information technology security/cyber security and voting systems. This group meets quarterly to provide feedback to the FVAP Director.

BALDWIN, RUSTY O.,

Professor of Computer Engineering, Associate Director, Center for Cyberspace Research, Department of Electrical and Computer Engineering, AFIT Appointment Date: 1999 (AFIT/ENG), BSEE, New Mexico State University, 1987; MS, Computer Engineering, Air Force Institute of Technology, 1992; PhD, Virginia Polytechnic Institute and State University, 1999. His research interests include computer communication networks, information warfare, performance modeling, and analysis and simulation of real-time communication systems. Tel. 937-255-6565 x4445 (DSN 785-6565 x4445), email: Rusty.Baldwin@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

"Side-Channel Analysis Resistant Advanced Encryption Standard (AES) FPGA Intellectual Property (IP)." Sponsor: AFRL/RV. Funding: \$490,000. [CCR]

"Technical Support, Military Medical System Modeling." Sponsor: TRICARE. Funding: \$4,100,000 – Baldwin 75%, Raines 25%. [CCR]

"Technical Support S/W Development." Sponsor: NSA. Funding: \$228,466 – Baldwin 75%, Raines 25%. [CCR]

SPONSOR FUNDED EDUCATIONAL PROJECTS

"Federal Cyber Service: Scholarship for Service (SFS)." Sponsor: NSF. Funding: \$811,341. [CCR]

REFEREED JOURNAL PUBLICATIONS

W. E. Cobb, E. D. Laspe, R. O. Baldwin, M. A. Temple, and Y. C. Kim, "Intrinsic Physical Layer Authentication of Integrated Circuits," accepted for publication in *Transactions on Information Forensics & Security*, Mar 2011, 24 pgs. [CCR]

D. J. Kelly, R. A. Raines, R. O. Baldwin, B. E. Mullins, and M. R. Grimala, "Exploring Extant and Emerging Issues in Anonymous Networks: A Taxonomy and Survey of Protocols and Metrics," *IEEE Communications Surveys and Tutorials*, Vol. PP, No. 99, pp. 1-28, June 13 2011. [CCR]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

W. E. Cobb, E. W. Garcia, M. A. Temple, R. O. Baldwin, and Y. C. Kim, "Physical Layer Identification of Embedded Devices Using RF-DNA Fingerprinting," *2010 IEEE Military Communications Conference (MILCOM 2010)*, San Jose, CA, October 2010, pp. 682-687. [CCR]

PATENTS

D. P. Montminy, R. O. Baldwin and P. D. Williams, "Relocatable Field Programmable Gate Array Bitstreams for Fault Tolerance," Patent #7,906,984, Mar 2011. [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

SPONSOR FUNDED RESEARCH PROJECTS

"Artificial Intelligent Agents for City Beat Program." Sponsor: AFRL/RH. Funding: \$155,000. [ANT]

REFEREED JOURNAL PUBLICATIONS

John Borowski, Ken Hopkinson, Jeffrey Humphries, and Brett Borghetti, "Reputation-Based Cooperative Trust for an Agent-Based Backup Protection Scheme," *IEEE Transactions on Power Delivery*, Vol. 2, No. 2, June 2011.

Ryan W. Thomas, Brett J. Borghetti, Ramakant S. Komali, and Petri Mahonen, "Understanding Conditions that Lead to Emulation Attacks in Dynamic Spectrum Access," *IEEE Communications Magazine*, Vol. 49, No. 3, March 2011.

Gary Lamont, Kurt Weissgerber, Brett Borghetti, and Gilbert L. Peterson, "Determining Solution Space Characteristics for Real Time Strategy Games and Characterizing Winning Strategies," *International Journal of Computer Games Technology*, March 2011.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Hyon Kwak and Brett Borghetti, "Reducing Communication Detection and Eavesdropping using Mobile Agent Relay Networks," *Winter Simulation Conference 2010*, Invited Paper, December 2010.

BOOKS AND CHAPTERS IN BOOKS

Brett Borghetti and Maria Gini, Weighted Prediction Divergence for Metareasoning, Chapter 16, *Metareasoning – Thinking About Thinking*, M. Cox and A. Raja, ed. MIT Press, Cambridge, MA, 2011, ISBN-10 0-262-01480-7.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Air University Information Technology Working Group.

Air University Learning and Information Technology Corporate Structure Board.

AFIT/EN Information Technology Working Chairperson (acting – 5 months).

AFIT/EN Information Technology Working Group (ENG representative).

AFIT Doctoral Council Member (Elected – Military Member at Large).

AFIT Academic Review Committee Member.

AFIT Faculty Development Council Member.

Department of Electrical and Computer Engineering Awards Committee Member.

Reviewer, Journal of Defense Modeling and Simulation, 2010-2011.

Reviewer, Air Force Office of Scientific Research Young Investigator Program, 2010.

BUTTS, JONATHAN W., Capt,

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

REFEREED JOURNAL PUBLICATIONS

M. Rice, J. Butts and S. Sheno, “An analysis of the legality of government-mandated computer inoculation,” International Journal of Critical Infrastructure Protection, Vol. 1, pp. 68-74, 2010.

J. Butts, M. Rice and S. Sheno, “An adversarial model for cyber attack on control protocols,” Journal of Defense Modeling and Simulation, June 2011.

M. Rice, J. Butts and S. Sheno, “A signaling framework to deter aggression in cyberspace,” International Journal of Critical Infrastructure Protection, Vol. 4, pp. 57-65, 2011.

R. Mills, M. Grimaldi, G. Peterson and J. Butts, “A scenario-based approach to mitigating the insider threat,” Information Systems Security Association Journal, Vol. 9, No. 5, pp 12-19, May 2011.

L. McMallie, J. Butts and R. Mills, “Security analysis of the ADS-B implementation in the next generation air transportation system,” International Journal of Critical Infrastructure Protection, Vol. 4, pp. 78-87, 2011.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

J. Lopez and J. Butts, “Mission assurance for control systems: A compliance-based strategy,” in *Proc. Fifth Annual IFIP WG 11.10 International Conference on Critical Infrastructure Protection*, Dartmouth College, NH, March 2011, 8 pages.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Chair, IFIP Working Group 11.10 on Critical Infrastructure Protection.

Committee chair for research organization task force, Coalition for the Advancement of Cybersecurity Education.

Co-chair, Fifth Annual International Conference on Critical Infrastructure Protection, May 2011.

Committee member, International Conference on Security and Management, special track, Mission Assurance and Critical Infrastructure Protection, July 2011.

Invited speaker to University of George Washington: J. Butts “Critical Infrastructure Protection,” University of George Washington, Department of Computer Science, November 2010.

Invited speaker to Colloquium for Information Systems Security Education: J. Butts, “Securing SCADA systems,” Dayton, Ohio, June 2011.

Invited speaker to Air Force Weapons and Tactics Conference: J. Butts, “What the Stux?” Nellis AFB, NV, Jan 2011.

Invited speaker to 262 NWS Industrial Control System Summit and DHS Control Systems Training: J. Butts, “Safeguarding Our Nation’s Critical Infrastructure” Joint Base Lewis McChord, Washington, July 2011.

Invited speaker to Emerging Threat Tactics Team Workshop: J. Butts, “Cyber-Physical System Assessments,” Nellis AFB, Nevada, September 2011.

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

REFEREED JOURNAL PUBLICATIONS

Paul F. Dolce and Stephen C. Cain, “3-D LADAR Range Estimation Using Expectation Maximization” *J. Appl. Remote Sens.*, Vol. **5**, doc identifier: 053513 (February, 2011).

M. W. Hyde S. C. Cain, J. D. Schmidt and M. J. Havrilla “Material Classification of an Unknown Object Using Turbulence-Degraded Polarimetric Imagery,” *IEEE Transactions on Geoscience and Remote Sensing*, Vol. **49**, No. 1, pp 264-276 (January, 2011).

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Paul F. Dolce and Stephen C. Cain, “An Expectation-Maximization Solution for Fusing 2-D and 3 D LADAR Data,” Computational Imaging IX, SPIE Proceedings 7873, San Francisco, CA, January 2011.

Stephen C. Cain, “Power Requirements for Polarimetric SAR imaging,” Unconventional Imaging, SPIE Proceedings, San Diego, CA, August 2011.

Samuel Mantravadi and Stephen Cain, “Blind Deconvolution of Long Exposure Lens-Based Chromotomographic Spectrometer Data,” Unconventional Imaging, SPIE Proceedings, San Diego, CA, August 2011.

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

SPONSOR FUNDED RESEARCH PROJECTS

“Hyperspectral Image Processing and Dismount Threat Recognition.” Sponsor: AFRL/RV. Funding: \$50,000 – Clark 95%, Peterson 5%.

COLLINS, PETER J.,

Associate Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2006 (AFIT/ENG); BA, Bethel College, MN, 1985; BSEE, University of Minnesota, 1985; MSEE, Air Force Institute of Technology, 1990; PhD, Air Force Institute of Technology, 1996. His research interests include low observables, computational electromagnetics, radar cross section metrology, remote sensing, and electromagnetic material design and analysis. He is a senior member of the IEEE. Tel. 937-255-3636 x7256 (DSN 785-3636 x7256), email: Peter.Collins@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

“Field Emission Technology Investigations.” Sponsor: AS&T. Funding: \$75,000 – Collins 75%, Coutu 25%.

“Enabling Technologies for Radar Scattering Measurements.” Sponsor: AFRL/RV. Funding: \$75,120.

REFEREED JOURNAL PUBLICATIONS

Moore, E. A., Langley, D., Jussaume, M. E., Rederus, L. A., Lundell, R. 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*, DOI 10.1007/s11340-011-9498-8, June 2011.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Nelms, M. E., Collins, P. J., “Development and Evaluation of a Multistatic Ultrawideband Random Noise Radar Network,” *The 2011 IEEE Radar Conference*, Kansas City, MO, 23-27 May 2011.

Priestly, J. A., Collins, P. J., “An Investigation of the Trade-offs Between Electronic Protection and Processing Efficiency in a Multistatic Noise Radar Network,” *The 2011 IEEE Radar Conference*, Kansas City, MO, 23-27 May 2011.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Jussaume, M. E., Collins, P. J., Coutu, Jr., R. A., “Characterization of a Variation on AFIT’s Tunable MEMS Cantilever Array Metamaterial,” *The 12th International Symposium on MEMS and Nanotechnology, SEM Annual Conference*, Uncasville, CT, 13-16 June 2011.

Langley, D., Moore, E. A., Coutu, Jr., R. A., Collins, P. J., “MEMS Integrated Metamaterials with Variable Resonance Operating at RF Frequencies,” *The 12th International Symposium on MEMS and Nanotechnology, SEM Annual Conference*, Uncasville, CT, 13-16 June 2011.

Collins, P. J., “Dielectric Strings: A Low Clutter Method for Bistatic RCS Measurements,” *The 2011 IEEE International Symposium on Antennas and Propagation*, Spokane, WA, 3-8 July 2011.

Chick D. F., Collins, P. J., Goodman, S. A., Martin, R. K., and Terzuoli, Jr., A. J. “Direction Finding With Mutually Orthogonal Antennas,” *The 2011 IEEE International Symposium on Antennas and Propagation*, Spokane, WA, 3-8 July 2011.

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, 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 IEEE. Tel. 937-255-3636 x7230 (DSN 785-3636 x7230), email: Ronald.Coutu@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

“Semiconductor Physics and Device Reliability.” Sponsor: AFRL/RV. Funding: \$40,000.

“Terahertz Component-Level Research for Sensing Applications.” Sponsor: WSU. Funding: \$20,000.

“Electronic Component Failure Prediction Tool Development.” Sponsor: AS&T. Funding: \$55,000.

“RF/Optical/Thermal Metamaterials Research.” Sponsor: AFRL/RX. Funding: \$144,000.

“Cleanroom Orientation/Usage.” Sponsor: AFRL/RX. Funding: \$35,000.

“Cleanroom Orientation/Usage (AFRL/RYS).” Sponsor: AFRL/RV. Funding: \$2,000.

“Cleanroom Orientation/Usage (AFRL/RVDD).” Sponsor: AFRL/RV. Funding: \$5,000.

REFEREED JOURNAL PUBLICATIONS

Moore, E.A., Langley, D., Jussauame, 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, pp 1-9, 2011.

Ostrow, A. and Coutu, Jr., R.A., “Novel Microelectromechanical Systems (MEMS) Image Reversal Fabrication Process based on Robust SU-8 Masking Layers,” *Journal of Micro/Nanolithography, MEMS, and MOEMS (JM3)*, Vol. 10, No. 3, pp 033016-1 – 033016-7, 2011.

Coutu, Jr., R.A., Collins, P.J., Moore, E.A., Langley, D., Jussauame, 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 (identifier) 10.1109/JMEMS.2011.2167659, pp 1-6, 2011.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Edelmann, T.A. and Coutu, Jr., R.A., “Microswitch Lifecycle Test Fixture for Simultaneously Measuring Contact Resistance (Rc) and Contact Force (Fc) in Controlled Ambient Environments,” *Proceedings of the 56th IEEE Holm Conference on Electrical Contacts*, pp. 309-316, Oct 2010.

Castle, B., Li, A., Coutu, Jr. R.A., Hengehold, R. and Van Nostrand, J., “Tunneling Atomic Force Microscopy Characterization of Cuprous Oxide Thin Films,” *Proceedings of the IEEE Nanotechnology Conference*, pp. 1-4, OR, 15-18 August 2011.

Glauvitz, N.E., Starman, L.A., Coutu, Jr., R.A. and Johnston, R.L., “Effects of SU-8 Crosslinking on Flip-Chip Bond Strength when Assembling and Packaging MEMS,” *Proceeding of Eurosensors XXV*, No. 1414, pp. 1-4, Athens, Greece, Sept 2011.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

- Ostrow, S.A., Lombardi, J.P. and Coutu, Jr., R.A., "Using positive photomasks to pattern SU-8 masking layers for fabricating inverse MEMS structures," *Proceedings of the SPIE Advanced Lithography Symposium, Advances in Resist Materials and Processing Technology XXVIII Conference*, Vol. 7972, pp. 2J:1-6, CA, 27 February – 3 March 2011.
- Christiansen, B., Coutu, Jr., R.A., Heller, E., Poling, B., Via, G.D., Ventury, R. and Shealy, J., "Reliability Testing of AlGaIn/GaN HEMTs under Multiple Stressors," *Proceedings of the IEEE International Reliability Physics Symposium*, pp. 680-648 (pp. CD2.1-2.5), CA, 12-14 April 2011.
- Baughner, J.P. and Coutu, Jr., R.A., "Micromechanical Structure With Stable Linear Positive and Negative Stiffness," *The 12th International Symposium on MEMS and Nanotechnology, SEM Annual Conference*, Vol. 4, pp. 137-143, CT, 13-16 June 2011.
- Langley, D., Moore, E.A., Coutu, Jr., R.A., and Collins, P.J., "MEMS Integrated Metamaterials With Variable Resonance Operating at RF Frequencies," *The 12th International Symposium on MEMS and Nanotechnology, SEM Annual Conference*, Vol. 4, pp. 159-166, CT, 13-16 June 2011.
- Lombardi, III J.P. and Coutu, Jr., R.A., "Investigations Into 1D and 2D Metamaterials at Infrared Wavelengths," *The 12th International Symposium on MEMS and Nanotechnology, SEM Annual Conference*, Vol. 4, pp. 151-158, CT, 13-16 June 2011.
- Jussaume, M.E., Collins, P.J. and Coutu, Jr., R.A., "Characterization of a Variation on AFIT's Tunable MEMS Cantilever Array Metamaterial," *The 12th International Symposium on MEMS and Nanotechnology, SEM Annual Conference*, Vol. 4, pp. 111-118, CT, 13-16 June 2011.
- Moore, E.A., Langley, D. and Coutu, Jr., R.A., "Terahertz Metamaterial Structures Fabricated by PolyMUMPs," *The 12th International Symposium on MEMS and Nanotechnology, SEM Annual Conference*, Vol. 4, pp. 145-150, CT, 13-16 June 2011.

BOOKS AND CHAPTERS IN BOOKS

- Crossley, B. L., Glauvitz, N. E., Quinton, B. T., Coutu, Jr., R. A., and Collins, P. J., (June 2011), Chapter Title: *Characterizing Multi-walled Carbon Nanotube Synthesis for Field Emission Applications*, (Editor: Prof Jose Mauricio Marulanda), Book Title: *Carbon Nanotubes / Book 2*, ISBN: 978-953-307-496-2 (First Edition, pp 1-22), InTech Open Access Publisher.

PATENTS

- Coutu, Jr., R. A. *et al*, "Shaped MEMS Contact (geometry)," US Patent 7,906,738, 15 March 2011.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Director, AFIT Class 1000 Cleanroom.

Chair, Microelectronics, Microelectromechanical Systems (MEMS) and Nanotechnology Curriculum.

Chief Faculty Advisor, Tau Beta Pi (TBP) Engineering Honor Society.

Faculty Advisor, Eta Kappa Nu (HKN) Electrical Engineering Honor Society.

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

Session Chair, MEMS/micro-contacts, 57th IEEE Holm Conference on Electrical Contacts.

Session Organizer and Chair, Metamaterials, 12th Annual Society of Experimental Mechanics Conference.

Technical Paper Reviewer: Elsevier Journal of Sensors and Actuators, Journal of Smart Materials and Structures, IEEE Transactions on Industrial Electronics, Journal of Micromechanics and Microengineering.

Invited Talk, “Basic Cleanroom Operations and Device Fabrication” presentation for NASIC Intel Analysts, Wright-Patterson AFB, OH, 17 November 2010.

Invited Talk, “THz Components and Device Fabrication” presented at Fall 2010 Wright State University THz Workshop, 19 November 10.

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

PATENTS

Jacoby, G. A., Davis, N. J. IV, and Marchany, R. C., "Detecting Software Attacks by Monitoring Electric Power Consumption Patterns," US Patent No.7,877,621 B2, 25 January 2011.

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

FISHER, KENNETH A., Maj,

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

SPONSOR FUNDED RESEARCH PROJECTS

“Non-GPS Navigation Using Radio-Based Ranging Combined with Additional Sensors ("Net-Enabled Non-GPS Navigation").” Sponsor: Raytheon. Funding: \$44,873 – Fisher 50%, Raquet 50%. [ANT]

“Air-to-Air Missile Flight Path Reconstruction.” Sponsor: 95 CPTS. Funding: \$39,079. [ANT]

“Increased Understanding of Vision-Aided Navigation Uncertainty Estimates.” Sponsor: AFRL/RV. Funding: \$50,000 – 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, Vol. XXVI, No. 2, pp. 24-33, Summer 2011. [ANT]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Paper reviewer for *IEEE Transactions on Automatic Control* journal. [ANT]

AFOSR proposal reviewer for Dr. Jon Sjogren (area: signals of opportunity navigation). [ANT]

Served as Subject Matter Expert to DARPA on Robust Surface Navigation Program. [ANT]

Served as Subject Matter Expert to F-22 SPO (Modernization Branch).

Guidance, Navigation, and Control Curriculum Chair. [ANT]

Session Chair for ION GNSS 2011. [ANT]

Department of Electrical and Computer Engineering Admissions Reviewer for MS-level applicants.

HAVRILLA, MICHAEL J.,

Associate Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT
Appointment Date: 2002 (AFIT/ENG); BS, Michigan State University, 1987, MSEE, Michigan State University, 1989, PhD, Michigan State University, 2001. His research interests include electromagnetics, guided wave theory and applications, material characterization, low observables, electromagnetic scattering and antenna theory. He is a member of HKN and Sigma Xi, Senior member of the IEEE, and a Full Member of the International Union of Radio Science-Commission B. Tel. 937-255-3636 x4582 (DSN 785-3636 x4582), email: Michael.Havrilla@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

“Material Measurement Laboratory Research.” Sponsor: AFRL/RY. Funding: \$145,000.

“Material Characterization of Complex Media.” Sponsor: AFRL/RY. Funding: \$50,000.

HEMMES, JEFFREY M., Maj,

Assistant Professor of Computer Science, Department of Electrical and Computer Engineering, AFIT
Appointment Date: 2009 (AFIT/ENG), BS, Computer Science, Indiana University South Bend, 1997; MS, Computer Systems, Air Force Institute of Technology, 1999; PhD, University of Notre Dame, 2009. His research interests include modeling and simulation of mobile ad-hoc networks, distributed systems, and software engineering. Tel. 937-255-3636 X4619 (DSN 785-3636 x4619), email: Jeffrey.Hemmes@afit.edu

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

J. Hemmes, M. Fisher, and K. Hopkinson, “Predictive Routing in Mobile Ad Hoc Networks,” in *Proc. Next Generation Mobile Applications and Services Conf. (NGMAST 11)*, pp. 117-122, Cardiff, UK, September 2011.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Served as a peer reviewer for four conference papers.

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. Tel. 937-255-3636 x4719, email: Douglas.Hodson@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

“Extensible Architecture for the Analysis and Generation of Linked Simulations (EAAGLES) Development.”
Sponsor: ASC/XR. Funding: \$66,000.

REFEREED JOURNAL PUBLICATIONS

C. L. Haase, R. R. Hill and D.D. Hodson, “Using Statistical Experimental Design to Realize LVC Potential in T&E” The International Test and Evaluation Association Journal, September 2011, Vol. 32, No. 3, pp. 288-297.

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

SPONSOR FUNDED RESEARCH PROJECTS

“A Context-Aware Middleware Architecture to Enable Large-Scale Networking.” Sponsor: AS&T. Funding: \$131,848. [ANT]

“Technical Support: Cognitive and Mobile Networks.” Sponsor: AFRL/RI. Funding: \$80,000 – Hopkinson 60%, Thomas 40%. [ANT]

“A Context-Aware Approach for Enabling Large-Scale Mobile Networks.” Sponsor: AFOSR. Funding: \$41,408. [ANT]

“HPC Summer Intern Support.” Sponsor: AFOSR. Funding: \$37,000.

REFEREED JOURNAL PUBLICATIONS

Borowski, J.F., Hopkinson, K.M., Humphries, J.W., and Borghetti, B.J., Reputation-Based Trust for a Cooperative Agent-Based Backup Protection Scheme, IEEE Transactions on Smart Grid, Vol. 2, No. 2, June 2011, pp. 287-301.

Carlos Gonzalez, J.M., Hopkinson, K.M., Greve, G.H., Compton, M.D., Wilhelm, J., Kurkowski, S.H., and Thomas, R.W., Optimization of Trust System Placement for Power Grid Security and Compartmentalization, IEEE Transactions on Power Systems, Vol. 26, No. 2, May 2011, pp. 550-563.

Llewellyn, L.C., Hopkinson, K.M., and Graham, S.R., Distributed Fault-Tolerant Quality of Service Routing in Mobile Wireless Networks, IEEE Transactions on Mobile Computing, Vol. 10, No. 2, February 2011, pp. 175-190.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Naga, V., Colombi, J., Grimaila, M., and Hopkinson, K., A Method to Determine Superior QoS Configurations for Mission Objectives: Aligning the Network with the Mission. Proceedings of the 2011 International Conference on Security and Management (SAM), 18-21 July 2011, Las Vegas, NV, USA, pp. 1-7.

Carlos Gonzalez, J.M., Hopkinson, K.M., Greve, G.H., Compton, M.D., Wilhelm, J., Kurkowski, S.H., and Thomas, R.W., Optimization of Trust System Placement for Power Grid Security and Compartmentalization, IEEE General Power Meeting, 24-29 July 2011, Detroit, MI, USA, pp. 1-1.

Reynolds, M.B., Hopkinson, K.M., Oxley, M.E., and Mullins, B.E., Provisioning Norm: An Asymmetric Quality Measure for SaaS Resource Allocation. Proceedings of the 2011 IEEE 8th International Conference on Services Computing (SCC), 4-9 July 2011, Washington D.C., USA, pp. 112-119.

Fadul, J., Hopkinson, K., Sheffield, C., Moore, J., and Andel, T., Trust Management and Security in the Future Communication-Based “Smart” Electric Power Grid, IEEE Hawaii International Conference on System Sciences (Electric Power Systems: Reliability, Security, and Trust Track), 4-7 January 2011, Koloa, HI, USA, pp. 1-10.

Haught, J., Hopkinson, K., Stuckey, N., Dop, M., and Stirling, A., A Kalman Filter-Based Prediction System for Better Network Context-Awareness (Invited Article), Proceedings of the 2010 Winter Simulation Conference, 5-8 December 2010, Baltimore, MD, USA, pp. 2927-2934.

HUMPHRIES, JEFFREY W., Lt Col,

Assistant Professor of Computer Science, Department of Electrical and Computer Engineering, AFIT
Appointment Date: 2008 (AFIT/ENG), BS Computer Science, United States Air Force Academy, 1992; MS Computer Science, Georgia Institute of Technology, 1993; PhD, Texas A&M University, 2001. His research interests include cryptography, computer/network security, information assurance, cyber operations, and software protection. Tel. 937-255-3636 x7253 (DSN 785-3636 x7253), email: Jeffrey.Humphries@afit.edu

REFEREED JOURNAL PUBLICATIONS

John F. Borowski, Kenneth M. Hopkinson, Jeffrey W. Humphries, and Brett J. Borghetti, “Reputation-Based Trust for a Cooperative Agent-Based Backup Protection Scheme,” *IEEE Transactions on Smart Grid*, Volume 2, Number 2, June 2011.

Kyle E. Stewart, Jeffrey W. Humphries, and Todd R. Andel, “An Automated Virtualization Performance Analysis Platform,” *Journal of Defense Modeling and Simulation*. (Jan 10, 2011).

REFEREED CONFERENCE PAPERS BASED ON FULL-PAPER REVIEW

Kyle E. Stewart, Todd R. Andel, and Jeffrey W. Humphries, “Measuring the Performance of Network Virtualization Tool N2N in the Design of a Cyber Warfare Training and Education Platform,” *Military Modeling and Simulation Symposium (MMS’11)*, 4-9 April 2011, Boston MA.

M. L. Stamat, B. E. Mullins, J. W. Humphries and M. R. Grimaila, “VIPER: A Virtual Infrastructure for Public-key Evaluation and Research,” *IEEE Military Communications Conference (MILCOM 2010)*, October 2010, San Jose CA.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Program committee for the 6th International Conference on Information Warfare and Security, Washington, DC, 17-18 March 2011.

Journal reviewer, *Journal of Defense Modeling and Simulation*, 2010.

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

SPONSOR FUNDED RESEARCH PROJECTS

“Material Estimation Polarization Phenomenology Research.” Sponsor: AFRL/RD. Funding: \$60,000.

REFEREED JOURNAL PUBLICATIONS

M. Hyde, M. Havrilla, and A. Bogle, “A novel and simple technique for measuring low-loss materials using the two flanged waveguides measurement geometry,” *Measurement Science and Technology*, Vol. 22, No. 8, 085704 (10 pp.), Jul 2011.

M. Hyde, S. Cain, J. Schmidt, and M. Havrilla, “Material classification of an unknown object using turbulence degraded polarimetric imagery,” *IEEE Transactions on Geoscience and Remote Sensing*, Vol. 49, No. 1, pp. 264-276, Jan 2011.

M. Hyde, J. Schmidt, M. Havrilla, and S. Cain, “Determining the complex index of refraction of an unknown object using turbulence-degraded polarimetric imagery,” *Optical Engineering*, Vol. 49, No. 12, 126201 (11 pp.), Dec 2010.

M. Hyde, J. Schmidt, M. Havrilla, and S. Cain, “Enhanced material classification using turbulence-degraded polarimetric imagery,” *Optics Letters*, Vol. 35, No. 21, pp. 3601-3603, Nov 2010.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

M. Havrilla, A. Bogle, M. Hyde, and E. Rothwell, “Electromagnetic material characterization of conductor-backed media using a NDE microstrip probe,” Proceedings of the International Conference on Electromagnetics in Advanced Applications (ICEAA), pp. 656-659, Torino, Italy, Sep 2011.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

T. Olney, M. Havrilla, and M. Hyde, “A simple non-destructive method for characterizing non-dispersive, low-loss dielectrics,” URSI National Radio Science Meeting Abstracts, Spokane, WA, Jul 2011.

M. Havrilla, A. Bogle, M. Hyde, and E. Rothwell, “Material characterization of a curved conductor-backed media using a conformal NDE microstrip probe,” URSI National Radio Science Meeting Abstracts, Spokane, WA, Jul 2011.

M. Spencer and M. Hyde, “Rough surface scattering as applied to laser target interaction of a multi-fiber laser source,” DEPS Directed Energy Beam Control Conference, Orlando, FL, May 2011.

M. Havrilla, A. Bogle, M. Hyde, and E. Rothwell, “RF material characterization of conductor-backed media using a NDE microstrip probe,” URSI National Radio Science Meeting Abstracts, p. 22, Boulder, CO, Jan 2011.

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 electromagnetic 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

SPONSOR FUNDED RESEARCH PROJECTS

“High Frequency Direction Finding Support.” Sponsor: SPAWAR. Funding: \$50,000 – Jackson 50%, Akers 50%.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

J. Gutierrez and J. Jackson, “SAR Imaging Using WiMAX OFDM PHY,” IEEE Radar Conference 2011, Kansas City, MO, May 23-27, 2011, p. 129-134.

A. Tempelis, M. Jussaume, and J. Jackson, “Comparison of Measured and Predicted Bistatic Scattering from a Right-Angle Dihedral,” IEEE Radar Conference 2011, Kansas City, MO, May 23-27, 2011, p. 135-140.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT

J. Jackson and P. Brady, “Radar Target Classification Using Morphological Image Processing,” SPIE Defense Security and Sensing Symposium: Algorithms for Synthetic Aperture Radar XVIII, April 25-29, 2011, Vol. 8051, 805114.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Science Fair Mentor for local high school student Jan-Mar 2011. Project titled “Clandestine Passive Radar Geolocation,” State Award Winner.

Provided consultation to NASIC on radar signal processing and data interpretation.

2011 National Aerospace and Electronics Conference Session Co-Chair.

Technical Paper Referee: IEEE Transactions on Aerospace and Electronic Systems, IEEE Transactions on Geoscience and Remote Sensing, IEEE Systems, Man and Cybernetics, Part A, Progress in Electromagnetics Research Journal of Electromagnetic Waves and Applications.

KIM, YONG C.,

Assistant Professor of Computer Engineering, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2003 (AFIT/ENG); BSCE, University of Washington, 1995; MSECE, University of Wisconsin, 1997; PhD, University of Wisconsin, 2002. His areas of interest are anti-tamper methodology for circuits, hardware assurance, advanced computer architecture, VLSI design, test, design for testability, synthesis, CAD tools, reconfigurable and fault-tolerant computing. Tel. 937-255-3636 x4620 (DSN 785-3636 x4620), email: Yong.Kim@afit.edu

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Yong C. Kim, Eric D. Trias, and Daniel R. Slaman, “Side Channel Analysis Countermeasures using Obfuscated Instructions,” The 44th Annual International Carnahan Conference on Security Technology (ICCST 2010), pp. 42-51, Oct. 5-8, 2010, San Jose, CA.

William E. Cobb, Eric W. Garcia, Michael A. Temple, Ruty O. Baldwin, and Yong C. Kim, “Physical Layer Identification of Embedded Devices Using RF-DNA Fingerprinting,” 2010 Military Communications Conference (MILCOM 2010), pp. 2168-2173, New Orleans, LA, Nov. 2010.

LAMONT, GARY B.,

Professor in the Department of Electrical and Computer Engineering, AFIT Appointment Date: 1970 (AFIT/ENG), B. of Physics, 1961; MSEE, 1967, PhD, 1970; University of Minnesota. He teaches courses in computer science and computer engineering. His research interests include: evolutionary computation, artificial immune systems, 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. He is a member of IEEE (senior member) ACM, ASEE, SIAM, Tau Beta Pi (chapter advisor) and Eta Kappa Nu. Tel. 937-255-2626x4718; email: Gary.Lamont@afit.edu

REFEREED JOURNAL PUBLICATIONS

Kurt Weissgerber, Gary Lamont, Brett Borghetti and Gilbert Peterson, *Determining Solution Space Characteristics for Real-Time Strategy Games and Characterizing Winning Strategies*, "International Journal of Computer Games Technology," Vol. 2011, article ID 834026, 17 pages, <http://www.hindawi.com/journals/ijcgt/contents/>

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

David L. Hancock, Gary B. Lamont, *Multi Agent Systems on Military Networks*, 2011 IEEE Symposium Series on Computational Intelligence Cyber Security (SSCI), Paris, Fr. In Electronic Proceedings, April, 2011.

David L. Hancock, Gary B. Lamont, *Reputation in a Multi Agent System for Flow-Based Network Attack Classification*, 2011 IEEE Symposium on Intelligence Agents (IA), Paris, Fr., In Electron Proceedings, April, 2011.

David L. Hancock, Gary B. Lamont, *Multi Agent System for Network Attack Classification using flow-Based Intrusion Detection*, 2011 IEEE Congress on Evolutionary Algorithms (CEC), New Orleans, In Electronic Proceedings, June, 2011.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

IEEE NAECON 2011 Technical Program Chair.

ACM GECCO 2011 Program Committee and paper reviewer.

IEEE CEC 2011 Program Committee and paper reviewer.

SEAL 2010 Program Committee and paper reviewer.

IEEE Transactions on Evolutionary Computation paper reviewer.

Agent-based Systems Project, Sponsor: 711 HPW/RH.

Evaluated seven SBIR/STTR Phase I proposals focusing on "optimization algorithm development for radar antenna array beam-forming and early warning" - AFRL/RYPD.

LANGLEY, DERRICK, Capt,

Instructor 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. 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

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), e-mail: Mary.Lanzerotti@afit.edu

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Panel Reviewer for National Science Foundation, February 2011 (Arlington, VA).

Participated in the 2011 annual meeting of the IEEE Press Editorial Board (San Francisco, CA), September 2011, as one of 13 elected board members.

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

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Kennard Laviers and Gita Sukthankar, "A Real-Time Opponent Modeling System for Rush Football" 22nd International Joint Conference on Artificial Intelligence, July 2011.

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, cognitive radio, and 3D laser radar imaging. Tel. 937-255-3636 x4625 (DSN 785-3636 x4625), email: Richard.Martin@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

"RF Anomaly Detection for Intent Assessment." Sponsor: ONR. Funding: \$93,925 – Martin 50%, Thomas 50%.

"Technical Support: Cognitive Communications Research." Sponsor: AFRL/RV. Funding: \$25,000 – Martin 40%, Thomas 40%, Silvius 20%.

"Distributed TDOA-Based Source Localization." Sponsor: AFOSR. Funding: \$31,041 – Martin 50%, Fisher 50%. [ANT]

"Laser Radar Range Resolution Enhancement through 3D Registration and Deconvolution." Sponsor: AFOSR. Funding: \$43,477 – Martin 50%, Cain 50%.

REFERRED JOURNAL PUBLICATIONS

Michael J. Veth, Richard K. Martin, and Meir P. Pachter, "Anti-aliasing Constraints for Image-based Feature Tracking Applications With and Without Inertial Aiding," IEEE Transactions on Vehicular Technology, Vol. 59, No. 8, October 2010, pp. 3744-3756. [ANT]

Richard K. Martin, Chunpeng Yan, H. Howard Fan, and Christopher Rondeau, "Algorithms and Bounds for Distributed TDOA-Based Positioning Using OFDM Signals," IEEE Transactions on Signal Processing, Vol. 59, No. 3, March 2011, pp. 1255-1268. [ANT]

Gokhan Altin and Richard K. Martin, "Bit-Error-Rate-Minimizing Channel Shortening using Post-FEQ Diversity Combining and a Genetic Algorithm," *Signal Processing*, Vol. 91, April 2011, pp. 1021-1031.

Jason R. McMahon, Richard K. Martin, and Stephen C. Cain, "Range Separation Performance and Optimal Pulse-Width Prediction of a three-dimensional flash laser detection and ranging using the Cramer-Rao Bound," *Applied Optics*, Vol. 50, No. 17, June 2011, pp. 2559-2571.

CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Paul Harmer, Ryan Thomas, Brady Christel, Richard Martin, and Cliff Watson, "Wireless Security Situation Awareness with Attack Identification Decision Support," *Proceedings of the 2011 IEEE Symposium on Computational Intelligence in Cyber Security*, Paris, France, April 2011, 7 pages.

R. K. Martin, A. King, R. W. Thomas, and J. Pennington, "Practical Limits in RSS-Based Positioning," *Proceedings of International Conf. on Acoustics, Speech, and Signal Processing (ICASSP)*, Prague, Czech Republic, May 2011, 4 pages.

R. K. Martin, R. W. Thomas, and Z. Wu, "Using Spectral Correlation for Non-Cooperative RSS-Based Positioning," *Proceedings of the IEEE Workshop on Statistical Signal Processing*, Nice, France, June 2011, 4 pages.

D. F. Chick, P. J. Collins, S. A. Goodman, R. K. Martin, and A. J. Terzuoli, Jr., "Direction Finding With Mutually Orthogonal Antennas," *2011 IEEE AP-S International Symposium on Antennas and Propagation and 2011 USNC/URSI National Radio Science Meeting*, Spokane, WA, July 2011, 4 pages.

CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

M. Song, J. R. Pennington, M. Silvius, R. Thomas, and R. K. Martin, "Design and Performance Tradeoffs in Digital Radio Processing Architectures," in *Proceedings of SDR Forum 2010*, December 2010, 6 pages.

T. J. Hardy, R. K. Martin, and R. W. Thomas, "Malicious Node Detection via Physical Layer Data," *Proceedings of the 44th Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA, November 2010, 5 pages.

A. Scott, T. J. Hardy, R. K. Martin, and R. W. Thomas, "What are the Roles of Electronic and Cyber Warfare in Cognitive Radio Security?" *Proceedings of the 54th IEEE Midwest Symposium on Circuits and Systems*, Seoul, Korea, August 2011, 4 pages. (Invited paper).

J. W. Motes, R. K. Martin, and K. A. Mathews, "LADAR Range Image Interpolation Exploiting Pulse Width Expansion," *SPIE Optics+Photonics, the Applications of Digital Image Processing XXXIV*, San Diego, CA, August 2011.

B. J. Neff, S. C. Cain, and R. K. Martin, "Discrimination of multiple ranges per pixel in 3D FLASH LADAR while minimizing the effects of diffraction," *SPIE Optics+Photonics, Unconventional Imaging and Wavefront Sensing VII*, San Diego, CA, August 2011.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Organized a booth for TechFest, a Dayton-area technology expo providing STEM outreach to high school students. The booth was run by 5 AFIT students with faculty supervision. 19-20 February 2011.

Peer reviewer for 9 journal papers and 3 conference papers.

MENDENHALL, MICHAEL J., Maj,

Assistant Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT
Appointment Date: 2006 (AFIT/ENG), BS in Computer Engineering, Oregon State University, 1996; MS in

Computer Engineering, Air Force Institute of Technology, 2001; Ph.D. in Electrical Engineering, Rice University, 2006. His research interests include machine learning, hyperspectral image processing, and target detection focused on detecting and characterizing dismounts to include psycho-physiological responses. Tel. 937-255-3636 x4614 (DSN 785-3636 x4614), email: Michael.Mendenhall@afit.edu

CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

K. Vongsy and M.J. Mendenhall, "A Comparative Study of Spectral Detectors," *Third Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing, IEEE WHISPERS*, Lisbon Portugal, 6-9 June 2011, pp 1-4.

A. Smailbegovic, M. Mendenhall, J. Clark, K. Gray, and R. Wooten, "Landslide Imaging and Detection with Horizontal-Scanning Active and Passive Remote Sensing Methods: A Study of Data Integration in Assessing Complex Target Environment," *Third Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing, IEEE WHISPERS*, Lisbon Portugal, 6-9 June 2011, pp 1-4.

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

SPONSOR FUNDED RESEARCH PROJECTS

"Ontological Modeling of the Cyber Vulnerability Analysis Task." Sponsor: AFRL/RV. Funding: \$28,540. [CCR]

REFEREED JOURNAL PUBLICATIONS

McCallie, D., Butts, J., and Mills, R., "Security Analysis of the ADS-B Implementation in the Next Generation Air Transportation System," *International Journal of Critical Infrastructure Protection*, pp 1-10, July 2011. [CCR]

Principi, P.D., Mills, R.F., and Stepaniak, M.J., "Mitigating Tactical Warfighter Dependence on Link-16," *USAF Weapons Review*, Spring/Summer 2011, pp 25-49 (10 pages). [CCR]

Mills, R.F., Grimaila, M.R., Peterson, G.L., and Butts, J.W., "A scenario-based approach to mitigating the insider threat," *Information Systems Security Association Journal*, May 2011, pp 12-19. [CCR]

Birdwell, M.B., and Mills, R., "Warfighting in Cyberspace: Evolving Force Presentation and Command and Control," *Air and Space Power Journal*, Spring 2011, Volume XXV, No. 1, pp 26-36. Article will also appear in *Air and Space Power Journal – Chinese Edition*, Summer 2011, Volume 5, No. 2. [CCR]

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*, pp. 1-23, March 2011. [CCR]

Schrader, K.R., Mullins, B.E., Peterson, G.L., and Mills, R.F., "An FPGA-based System for Tracking Digital Information Transmitted via Peer-to-Peer Protocols," *International Journal of Security and Networks (IJSN)*, Vol. 5, No. 4, pp. 236-247, 2011. [CCR]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Woskov, S.M., Grimaila, M.R., Mills, R.F., and Haas, M.W., "Design Consideration for a Case-Based Reasoning Engine for Scenario-Based Cyber Incident Notification," 2011 IEEE Symposium Series on Computational Intelligence in Cyber Security (CICS 2011), Paris, France, April 2011. [CCR]

Miller, J.L., Mills, R.F., Grimaila, M.R., and Haas, M.W. "A Scalable Architecture for Improving the Timeliness and Relevance of Cyber Incident Notifications," 2011 IEEE Symposium Series on Computational Intelligence in Cyber Security (CICS 2011), Paris, France, pp. 1-8, April 2011. [CCR]

Myers, J., Grimaila, M.R., and Mills, R.F., "Log-Based Distributed Security Event Detection Using Simple Event Correlator," accepted for Hawaii International Conference on System Sciences (HICSS-44), pp. 1-7, Jan 2011. [CCR]

Grimaila, M.R., Mills, R.F., Haas, M., and Kelly, D., "Mission Assurance: Issues and Challenges," 2010 International Conference on Security and Management (SAM10), Las Vegas NV, 2010, pp 651-657. [CCR]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

"Development and Maturation of the IDE Cyber Warfare IDE Program at the Air Force Institute of Technology," Air Education and Training Command Symposium, San Antonio TX, Jan 2011.

Panel Member, "Cyberspace and Military Deception," INFOWARCON Cyber 2011, Linthicum Heights MD, Sept 2011.

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, computer/network security, computer communication networks, embedded (sensor) and wireless networking, and reconfigurable computing. Tel. 937-255-3636 x7979 (DSN 785-3636 x7979), email: Barry.Mullins@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

"Development and Implementation of a Testbed for Research and Analysis of Malware." Sponsor: DHS. Funding: \$192,138 – Mullins 20%, Humphries 20%, Butts 20%, Robinson 20%, Raines 20%. [CCR]

"Cyber Operations Support." Sponsor: AFRL/RV. Funding: \$18,765 – Mullins 67%, Baldwin 33%. [CCR]

SPONSOR FUNDED EDUCATIONAL PROJECTS

"IASP Tuition and Resource Support for the AFIT Center for Cyberspace Research (CCR)." Sponsor: NSA. Funding: \$247,026 – Mullins 50%, Raines 50%. [CCR]

REFEREED JOURNAL PUBLICATIONS

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.

B. W. Ramsey, B. E. Mullins, R. W. Thomas and T. R. Andel, "Subjective Audio Quality over a Secure IEEE 802.11n Network," *International Journal of Security and Networks (IJSN)*, Vol. 6, No. 1, 2011, pp. 53-63.

K. R. Schrader, B. E. Mullins, G. L. Peterson and R. F. Mills, "An FPGA-based System for Tracking Digital Information Transmitted via Peer-to-Peer Protocols," *International Journal of Security and Networks (IJSN)*, Vol. 5, No. 4, 2011, pp. 236-247.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

M. B. Reynolds, K. H. Hopkinson, M. E. Oxley and B. E. Mullins, "Iterative Configuration Method: An Effective and Efficient Heuristic for Service Oriented Infrastructure Resource Allocation," 2010 IEEE 6th World Congress on Services, Miami FL, 2010, pp. 156-157.

D. T. Merritt and B. E. Mullins, "Identifying Cyber Espionage: Towards a Synthesis Approach," 6th International Conference on Information Warfare and Security (ICIW 2011), George Washington University, Washington DC, 17-18 March 2011, pp. 180-187.

J. R. Erskine, G. L. Peterson, B. E. Mullins and M. R. Grimaila, "Developing Cyberspace Data Understanding: Using CRISP-DM for Host-based IDS Feature Mining," Sixth Annual Workshop on Cyber Security and Information Intelligence Research (CSIIRW 10) 2010, Oak Ridge, TN, pp. 1-4.

M. L. Stamat, B. E. Mullins, J. W. Humphries and M. R. Grimaila, "VIPER: A Virtual Infrastructure for Public-key Evaluation and Research," IEEE Military Communications Conference (MILCOM 2010), October 2010, San Jose CA, pp. 1-6.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Member, Technical Program Committee for the 7th International Conference on Information Warfare and Security (ICIW 2012).

Member, Technical Program Committee for the Wireless Networking Symposium (WNS) at 2011 IEEE Global Communications Conference (GLOBECOM 2011).

Reviewer, American Society for Engineering Education (ASEE), Computers in Education Division, ASEE Annual 2011 Conference.

Member, Technical Program Committee for the 6th International Conference on Information Warfare and Security (ICIW 2011).

Reviewer, IEEE Military Communications Conference (MILCOM 2010).

Member, Technical Program Committee for the Wireless Networking Symposium (WNS) at 2010 IEEE Global Communications Conference (GLOBECOM 2010).

Member, Executive Committee for the 5th International Conference on Information Warfare and Security (ICIW 2010).

Member, Technical Program Committee for the 5th International Conference on Information Warfare and Security (ICIW 2010).

Reviewer, Military Operations Research Journal.

Reviewer, International Journal of Critical Infrastructure Protection, Elsevier Publishers.

PACHTER, MEIR,

Professor, Department of Electrical and Computer Engineering, AFIT Appointment Date: 1993 (AFIT/ENG); BS, Israel Institute of Technology, 1967; MS, Israel Institute of Technology, 1969; PhD, Israel Institute of Technology, 1975. Dr. Pachter's fields of expertise include automatic control of aircraft and missiles, adaptive control and system identification, inertial and GPS navigation, autonomous control/neural

networks/fuzzy logic control, nonlinear control, and applied mathematics. Dr. Pachter has published papers in these areas and in differential games, robotics, and the theory of computational geometry. Dr. Pachter is interested in the application of mathematics to the solution of engineering and scientific problems. His current areas of interest include military operations optimization, cooperative control, estimation and optimization, statistical signal processing, adaptive optics, inertial navigation, and GPS navigation. For his work on adaptive and reconfigurable flight control, he received the AF Air Vehicle's Directorate Foulis award for 1994, together with Phil Chandler and Mark Mears. Tel. 937-255-3636 x7247 (DSN 785-3636 x4593), email: Meir.Pachter@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

"Cooperative Control." Sponsor: AFRL/RB. Funding: \$10,000. [ANT]

"Decision Support Techniques." Sponsor: AFRL/RV. Funding: \$15,000. [ANT]

"Cooperative Intelligent Control & Estimation." Sponsor: AFOSR. Funding: \$48,647. [ANT]

"Games, Information and Deception Exploitation for Adversarial Network Systems." Sponsor: AFOSR. Funding: \$46,986. [ANT]

"Advanced Autonomous Navigation." Sponsor: AFRL/RV. Funding: \$15,000. [ANT]

REFEREED JOURNAL PUBLICATIONS

M. Veth, R. Martin, and M. Pachter, "Anti-aliasing Constraints for Image-based Feature Tracking Applications With and Without Inertial Aiding," IEEE Transactions on Vehicular Technology, Vol. 59, No. 8, October 2010, pp. 3744-3756. [ANT]

Y. Cao, G. GU and M. Pachter, "Target Motion Analysis Based on Peak Power Measurements Using Networked Sensors," IEEE Transactions on Aerospace and Electronic Systems, Vol. 47, No. 2, April 2011. [ANT]

K. Krishnamoorthy, M. Pachter, S. Dhaba, and P. Chandler, "Approximate Dynamic Programming with State Aggregation Applied to UAV Perimeter Patrol," International Journal of Robust and Nonlinear Control, Vol. 21, 2011. [ANT]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

K. Kalyanam, M. Pachter, and P. Chandler, "State Aggregation Based Linear Programming Approach to Approximate Dynamic Programming," CDC 2010, pp. 935-941, 15-17 December 2010, Atlanta, GA. [ANT]

M. Pachter and K. Pham, "Basic Issues Concerning the Role of Information in Dynamic Games," International Conference on the Dynamics of Information Systems, 16-18 February 2011, Gainesville, FL. [ANT]

M. Pachter and Y. Choi, "A Relay-Rover Differential Game," 51st Israel Annual Conference on Aerospace Sciences, 23-24 February 2011, Tel Aviv, Israel. [ANT]

K. Kalyanam, M. Pachter, and P. Chandler, "UAV Perimeter Patrol Operations Optimization Using Efficient Dynamic Programming," ACC, San Francisco, CA, 29 June – 1 July 2011. [ANT]

T. Welker, R. Huffman, and M. Pachter, "Use of Gravity Gradiometry in Precision Inertial Navigation," AIAA Guidance, Navigation and Control Conference, Portland, OR, 8-11 August 2011. AIAA paper 2011-6643. [ANT]

K. Kalyanam, M. Pachter, and P. Chandler, "Maximizing the Throughput of a Patrolling UAV by Dynamic

Programming,” IEEE Multi-conference on Systems and Control, accepted for presentation, Denver, CO, September 2011. [ANT]

BOOKS AND CHAPTERS IN BOOKS

M. Pachter and G. Mutlu, “The Navigation Potential of Ground Feature Tracking,” in Dynamics of Information Systems: Theory and Applications, pp. 287-303, Springer, 2010. [ANT]

PETERSON, GILBERT L.,

Associate Professor of Computer Engineering, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2002 (AFIT/ENG); BS Architecture University of Texas at Arlington, 1995; MS, Computer Science, University of Texas at Arlington, 1998; PhD, University of Texas at Arlington, 2001. His research interests include uncertainty in artificial intelligence, robotics, machine learning, and digital forensics. Tel. 937-255-6565 x4281 (DSN 785-6565 x4281), email: Gilbert.Peterson@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

“INSeCT: Intelligent Navigation and Sensing Cooperative Tasks.” Sponsor: AFRL/RV. Funding: \$75,113 – Peterson 85%, Raquet 15%. [ANT]

“MEMSENSE: Hypervisor-Based Memory Sensing for Network Defense Applications,” Sponsor: AFRL/RI. Funding: \$105,000 – Peterson 34%, Mullins 33%, Kim 33%. [CCR]

“UBR-Brawler.” Sponsor: ASC/XR. Funding: \$76,000 – Peterson 50%, Borghetti, 50%. [ANT]

REFEREED JOURNAL PUBLICATIONS

Woolley, B., Peterson, G.L., and Kresge, J.T., Real-Time Behavior Based Robot Control System, *Autonomous Robots*, Vol. 30, No. 3, 2011, pp. 233-242. DOI: 10.1007/s10514-010-9215-y. [ANT]

Okolica, J., and Peterson, G.L., “Windows Operating System Agnostic Memory Analysis,” *Digital Investigation: The International Journal of Digital Forensics & Incident Response*, Vol.7, 2010, pp S48-S56. DOI: 10.1016/j.diin.2010.05.007. (Best Paper Award DFRWS 2010).

Mills, R.F., Grimaila, M.R., Peterson, G.L., and Butts, J.W., “A Scenario-Based Approach to Mitigating the Insider Threat,” *Information Systems Security Association Journal*, May 2011, pp. 12-19.

Schrader, K.R., Mullins, B.E., Peterson, G.L., and Mills, R.F., “An FPGA-Based System for Detecting and Tracking Contraband Digital Information Transmitted Via Peer-to-Peer Protocols,” *International Journal of Security and Networks (IJSN)*, Vol. 5, No. 4, 2011, pp. 236-247.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Peterson, G. L., Mayer, C.M., and Cousin, K., “WoLF Ant,” *IEEE Congress on Evolutionary Computation 2011*, New Orleans, LA, 2011, pp. 557.1-557.8. [ANT]

Smith, M.J., Boxerbaum, A.J., Peterson, G.L., and Quinn, R.J., “Electronic Image Stabilization using Optical Flow with Inertial Fusion,” *2010 IEE/RSJ International Conference on Intelligent Robots and Systems*, Taipei, Taiwan, October 2010, pp. 1146-1153, DOI: 10.1109/IROS.2010.5651113. [ANT]

Dube, T., Raines, R.A., Peterson, G.L., Bauer, K.W., Grimaila, M.R. and Rogers, S.K., “Malware Type Recognition and Cyber Situational Awareness,” International Workshop on “Mission Assurance: Tools, Techniques, and Methodologies,” *2010 IEEE Second International Conference on Social Computing*, Minneapolis MN, 2010, pp 938-943.

Dodge, D.A., Mullins, B.E., Peterson, G.L., and Okolica, J.S., “Simulating Windows-Based Cyber Attacks Using Live Virtual Machine Introspection,” *Summer Computer Simulation Conference (SCSC2010)*, Ottawa Canada, 2010, pp. 550-555.

Clark, J.D., Mendenhall, M.J., and Peterson, G.L., “Stochastic Feature Selection with Distributed Feature Spacing for Hyperspectral Data,” *Second Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing (IEEE WHISPERS)*, Reykjavic, Iceland, 2010, pp. 1-4. DOI: 10.1109/WHISPERS.2010.5594951.

Weyers, C., and Peterson, G.L., “Improving Occupancy Grid FastSLAM by Integrating Navigation Sensors,” *IEEE/RSJ International Conference on Intelligent Robots and Systems*, San Francisco, CA, 2011, pp. TBD. [ANT]

BOOKS AND CHAPTERS IN BOOKS

Peterson, G.L., and Sheno, S. *Advances in Digital Forensics VII*, New York, NY: Springer Science+Business Media, (in press) 2011.

Okolica, J., and Peterson, G.L., “ A Compiled Memory Analysis Tool,” *Advances in Digital Forensics VI*, S. Sheno and K.P. Chow, Ed., Boston, MA: Springer, 2010, pp 195-204.

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, Seventh Annual IFIP WG 11.9 International Conference on Digital Forensics.

Co-Chair, Eighth Annual IFIP WG 11.9 International Conference on Digital Forensics.

Special Issue Guest Editor, *Journal of Defense Modeling and Simulation*, Special Issue on Cyber Defense – Methodologies and Techniques for Evaluation.

Technical Program Committee Member, 11th Annual Digital Forensics Research Workshop.

Technical Program Committee Member, IEEE Systematic Approaches to Digital Forensics Engineering.

Program Committee Member, International Conference on Information Warfare and Security (ICIW).

Computer Forensics Track Program Committee, ACM 26th Symposium on Applied Computing.

Technical Paper Reviewer: *Journal of Defense Modeling and Simulation*, Digital Forensics Practice, *Journal of Digital Forensics, Security and Law*, *International Journal of Critical Infrastructure Protection*, *Journal of Navigation*.

Judge and Rules Committee Member, ION Robotic Lawnmower Competition.

POCHET, MICHAEL C., Maj,

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

SPONSOR FUNDED RESEARCH PROJECTS

“Terahertz Photonic Oscillators.” Sponsor: AFOSR. Funding: \$27,862.

REFERRED JOURNAL PUBLICATIONS

Pochet, M., Naderi, N.A., Kovanis, V., and Lester, L.F., “Modeling the Dynamic Response of an Optically Injected Nanostructure Diode Laser,” *IEEE Journal of Quantum Elec.* 47(6), 827-833 (2011).

CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER

Naderi, N. A., Pochet, M. C., Grillot, F., Shirkhorshidian, A., Kovanis, V., Lester, L. F., “Manipulation of the Linewidth Enhancement Factor in an Injection-Locked Quantum-Dash Fabry-Perot Laser at 1550nm,” 23rd Annual Meeting of the IEEE Photonics Society, 427-428, (Nov 2010).

CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Pochet, M. C., Naderi, Kovanis, V., Lester, L. F., “Optical-Injection of Quantum-Dash Semiconductor Lasers at 1550nm for Tunable Photonic Oscillators,” *Proc of SPIE* 7933, 79330A-(1-10) (2011). Invited Paper.

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

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

T. Dube, R. Raines, G. Peterson, K. Bauer, M. Grimaila, and S. Rogers, “Malware Type Recognition and Cyber Situational Awareness,” *The Second IEEE International Conference on Information Privacy, Security, Risk and Trust*, 2010 Minneapolis MN, 10% acceptance rate, BEST PAPER AWARD, pp 938-943. [CCR]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Panel Member/Reviewer for National Science Foundation 2011. [CCR]

Session Chair, 5th Annual IFIP WG 11.10 International Conference on Critical Infrastructure Protection, Dartmouth College, Hanover NH. [CCR]

Member, National Board for Information Security Examiners. [CCR]

Member, Program Committee, 15th Colloquium for Information Systems Security Education (CISSE). [CCR]

Provided 39 invited cybersecurity talks and presentations to AF, DOD, and Federal Government agencies. [CCR]

RAQUET, JOHN F.,

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

sensors, autonomous vehicle navigation and control, and electromagnetic interference and mitigation techniques affecting GPS performance. Tel. 937-255-3636 x4580 (DSN 785-3636 x4580), email: John.Raquet@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

“Precision Indoor and Outdoor Navigation Using Existing Signals of Opportunity and Inertial Navigation Sensors.” Sponsor: DAGSI. Funding: \$21,420. [ANT]

“ANT Center Laboratory Support per Attachment 6 of the MOA between AFIT and AFRL.” Sponsor: AFRL/RV. Funding: \$310,000 – Raquet 50%, Fisher 50%. [ANT]

“Passive Optical Navigation using Polarimetric Imaging Sensors.” Sponsor: AFOSR. Funding: \$29,500. [ANT]

“Support of Sfcs-Based Underground Geopositioning (S-BUG) Program.” Sponsor: DARPA. Funding: \$20,000. [ANT]

“Image-Aided Navigation for Automated Aerial Refueling.” Sponsor: AFRL/RB. Funding: \$265,000 – Raquet 50%, Fisher 50%. [ANT]

“Ultra-High Accuracy Reference System (UHARS) Support.” Sponsor: 746 TS. Funding: \$100,000 – Raquet 90%, Fisher 10%. [ANT]

“Testbed Development for All-Source Positioning and Navigation (ASPN) Program.” Sponsor: DARPA. Funding: \$201,428 – Raquet 34%, Fisher 33%, Peterson 33%. [ANT]

REFEREED JOURNAL PUBLICATIONS

Fisher, K., and J. Raquet, “Non-GPS Precision Position, Navigation, and Timing,” *Air and Space Power Journal*, Vol. XXV, No. 2, pp. 24-33, Summer 2011. [ANT]

Taylor, C., M. Veth, J. Raquet, and M. Miller, “Techniques for Navigation in Unmapped Environments,” *IEEE Transactions on Aerospace and Electronic Systems*, Vol. 47, No. 2, pp. 946-958, April 2011. [ANT]

Larson, C., J. Raquet, and M. Veth, “The Impact of Attitude on Image-Based Integrity,” *NAVIGATION: Journal of the Institute of Navigation*, Vol. 57, No. 4, pp. 249-262, Winter 2010. [ANT]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

D. Venable, J. Campbell, J. Raquet, and M. Veth, “Image-Aided Navigation Applied: Wide Area Sensing,” presented at 2011 Joint Navigation Conference, Colorado Spring, CO, June 2011. [ANT]

M. Smearcheck, T. Pestak, J. Kresge, J. Raquet, and K. Fisher, “EO Camera and Lidar Measurements for Autonomous Aerial Refueling Operations,” presented at 2011 Joint Navigation Conference, Colorado Springs, CO, June 2011. [ANT]

Haker, M., and J. Raquet, “Modeling and Simulation of the GNSS Channel Through the Stochastic Search and Parameterization of Received Signals,” presented at 2011 Joint Navigation Conference, Colorado Springs, CO, June 2011. [ANT]

Kauffman, K., J. Raquet, Y. Morton, and D. Garmatyuk, “Simulation Study of UWB-OFDM SAR for Navigation with INS Integration,” *Proceedings of ION International Technical Meeting*, San Diego, CA, January 2011. [ANT]

Storms, W. J. Shockley, and J. Raquet, "Magnetic Field Navigation in an Indoor Environment," Proceedings of Ubiquitous Positioning Indoor Navigation and Location Based Service (UPINLBS) (in IEEE Xplore), October 2010. [ANT]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Raquet, J., and J. Campbell, "GPS 101," tutorial taught to 100 attendees of 2011 Joint Navigation Conference, June 2011. [ANT]

Raquet, J., "GPS Receiver Design," presented to 45 industrial members and students from COUNT Consortium, June 2011. [ANT]

Raquet, J., "Alternative Navigation Topics," presented to 30 engineers at the Precision Navigation and Timing Workshop with Singapore (sponsored by AFOSR), December 2010. [ANT]

Raquet, J., and M. Veth, "Vision Based Navigation," presented to 30 engineers at the Precision Navigation and Timing Workshop with Singapore (sponsored by AFOSR), December 2010. [ANT]

Raquet, J., and G. Peterson, "Cooperative and Autonomous Vehicles," presented to 30 engineers at the Precision Navigation and Timing Workshop with Singapore (sponsored by AFOSR), December 2010. [ANT]

AFIT PI for the Consortium of Ohio Universities on Navigation and Timekeeping (COUNT). [ANT]

Office of the Secretary of Defense (OSD) PNT S&T Roadmap, January 2007 – present. Helping to update the OSD PNT S&T Roadmap, which is a document describing the S&T activities for PNT technology over the next 20 years. [ANT]

Chairman, Institute of Navigation (ION) Satellite Division. [ANT]

Scientific (organizing) committee, International Conference on Ubiquitous Positioning, Indoor Navigation, and Location-Based Service, Helsinki, Finland, October 2010. [ANT]

Awards Committee Member, Institute of Navigation (ION). [ANT]

AFRL/RV, consulting support for LEGAND program, March 2008 – present. [ANT]

DARPA, consulting support for S-BUG and RSN navigation programs, January 2009 – present. [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

SPONSOR FUNDED RESEARCH PROJECTS

"Enabling Cyber Operations." Sponsor: DARPA. Funding: \$55,470.

"Cyber-Based Planning and Assessment." Sponsor: AFRL/RI. Funding: \$25,270.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

R. Savell, D. Robinson, J. Murphy, I. Gregorio-de Souza, V. Berk, and G. Cybenko. Computational Behavioral Analysis for Insider Threat Detection, 2010 Center for Academic Excellence Workshop on Insider Threat, pgs 17-26.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Invited guest speaker at MIT Lincoln Laboratory 2011 Cyber and Netcentric Workshop.

Keynote speaker at Idaho National Laboratory sponsored 1st Experimental Security Panoramas (ESP) workshop, 9 Aug 2011.

SAVILLE, MICHAEL A., Maj,

Assistant Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT
Appointment Date: 2006 (AFIT/ENG), BSEE, Texas A&M University, 1997; MSEE, Air Force Institute of Technology, 2000; PhD, University of Illinois at Urbana-Champaign, 2006. His research interests include synthetic aperture radar (SAR) imaging and inverse problems, radar signal processing, electromagnetic radiation and scattering phenomenology, computational electromagnetics, and electromagnetic theory. Tel. 937-255-3636 x4719 (DSN 785-3636 x4719), email: Michael.Saville@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

“Polarization Based Feature Extraction Algorithm.” Sponsor: AS&T. Funding: \$52,472 – Saville 75%, Jackson 25%.

SCHMIDT, JASON D., Maj,

Assistant Professor of Electro-Optics, Department of Electrical and Computer Engineering, AFIT,
Appointment Date: 2006 (AFIT/ENG), BS in Physics, Marquette University 1998; MS in Physics 2000, The Ohio State University; PhD in Electro-Optics 2006, University of Dayton. His research interests include optical effects of atmospheric turbulence, adaptive optics, free-space optical communications, laser weapons, and optical modeling. He is a member of SPIE, OSA, and DEPS.

SPONSOR FUNDED RESEARCH PROJECTS

“Material Characterization of an Unknown Object Using Passive Remote Sensing.” Sponsor: AFOSR. Funding: \$23,920. [CDE]

“Integrated Approach to Free-Space Optical Communications.” Sponsor: AFOSR. Funding: \$9,920. [CDE]

“Phase Unwrapping in Strong Turbulence.” Sponsor: AFOSR. Funding: \$33,000. [CDE]

“Advanced Wavefront Estimation in Strong Turbulence.” Sponsor: AFOSR. Funding: \$99,656. [CDE]

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

SPONSOR FUNDED RESEARCH PROJECTS

“Cognitive Radio Network Security.” Sponsor: JPL. Funding: \$35,000 – Silvius 51%, Hopkinson 49%.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

M. Song, J. R. Pennington, M. D. Silvius, R. W. Thomas, R. K. Martin, C. W. Bostian, "Design and Performance Tradeoffs in Digital Radio Processing Architectures," in Software Defined Radio Technical Conference, Washington, DC, November 30 - December 3, 2010, p. 282-287.

STARMAN, LaVERN A., Lt Col,

Assistant Professor of Electrical Engineering, Department of Electrical and Computer engineering, AFIT Appointment Date: 2005 9AFIT/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 Kapa Nu, Sigma Xi and Tau Beta Pi. Tel. 937-255-3636 x4618 (DSN 785-3636 x4618), e-mail: Lavern.Starman@afit.edu

REFEREED JOURNAL PUBLICATIONS

Moore, E.A., Langley, D., Jussuame, 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, pp 1-9, 2011.

Coutu, Jr., R.A., Collins, P.J., Moore, E.A., Langley, D., Jussuame, 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 (identifier) 10.1109/JMEMS.2011.2167659, pp 1-6, 2011.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Glauvitz, N.E., Starman, L.A., Coutu, Jr., R.A. and Johnston, R.L., "Effects of SU-8 Crosslinking on Flip-Chip Bond Strength when Assembling and Packaging MEMS," Proceeding of Eurosensors XXV, No. 1414, pp. 1-4, Athens, Greece, Sept 2011.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Elected Secretary for the MEMS/Nano Technical Division at the Society of Engineering Mechanics (SEM) Conference Elected Military Representative for the Doctoral Council Committee.

STEPANIAK, MICHAEL J., Lt Col,

Assistant Professor and Electrical Engineering Division Chief, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2008 (AFIT/ENG), BSEE, Carnegie Mellon University, 1994, MSEE, Air Force Institute of Technology, 1995, Ph.D. Ohio University, 2008. His research interests include precision navigation and flight control. Lt Col Stepaniak is a senior member of the AIAA, a member of the IEEE, and a member of the Eta Kappa Nu, Tau Beta Pi, and Phi Kappa Phi honorary societies. Tel. 937-255-3636 x4603 (DSN 785-3636 x4603), email: Michael.Stepaniak@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

"Integrated Precision Ordnance Delivery System (IPODS) Support." Sponsor: DTRA. Funding: \$45,000. [ANT]

REFEREED JOURNAL PUBLICATIONS

Principi, P. D., R. F. Mills, and M. J. Stepaniak, "Mitigating Tactical Warfighter Dependence on Link 16," USAF Weapons Review, pp. 25-33 and 49, Spring/Summer 2011.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Oktay, H., and M. J. Stepaniak, "Airborne Pseudolites in a Global Positioning System Degraded Environment," Proceedings of the 5th International Conference on Recent Advances in Space Technology, Istanbul, Turkey, pp. 280-285, June 2011. [ANT]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Academic advisor to USAF Test Pilot School (TPS) selection board.

Technical evaluator for AFRL/DTRA \$7.5M IPODS Phase II contract. [ANT]

Technical/Safety Review Board Chair for ENV/ENY CONDOR flight test program.

Member, ENG Awards and Curriculum Committees and AFIT Civilian Student Working Group.

Chairman, Institute of Navigation (ION) Dayton Section , June 2010–June 2011.

Council Member, Institute of Navigation (ION), June 2010–June 2011.

Treasurer, Society of Flight Test Engineers (SFTE) Wright Chapter, May 2011–Present.

Secretary, Society of Flight Test Engineers (SFTE) Wright Chapter, June 2009–May 2011.

Member, Association of Old Crows (AOC).

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

SPONSOR FUNDED RESEARCH PROJECTS

"Phase III Support: RF-EW Systems." Sponsor: AFRL/RY. Funding: \$377,000. [CCR]

"RFINT for Commercial Communications." Sponsor: AS&T. Funding: \$99,952. [CCR]

"CR/SDR-Based RFINT Technologies." Sponsor: LTS. Funding: "\$44,924. [CCR]

REFEREED JOURNAL PUBLICATIONS

W. E. Cobb, E.D. Lapse, R.O. Baldwin, M.A. Temple, and Y.C. Kim, "Intrinsic PHY Layer Authentication of ICs with RF-DNA Fingerprinting," *IEEE Trans Info Forensics & Security, Special Issue: IC & Sys Security*, Aug 2011.

TERZUOLI, ANDREW J., Jr.,

Associate Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT Appointment Date: 1982 (AFIT/ENG); BS, Electrical Engineering, Polytechnic Institute of Brooklyn, 1969; MS, Electrical Engineering, Massachusetts Institute of Technology, 1970; PhD, Electrical Engineering, The Ohio State University, 1982. His research areas have included Antennas and Electromagnetics; Computer

Model Based Studies; Application of Parallel Computation, VLSI Technology, and RISC Architecture to Numerical and Transform Methods; Remote Sensing and Communication; Passive RF Sensing; Wave Scattering, Radar Cross Section, and Stealth (LO/CLO) Technology; Machine Vision and Image Processing; Automated Object Recognition. He has published numerous reports and articles in journals and conference proceedings in these and related areas. His research is funded by various agencies including AFRL and NASIC. Prior to joining AFIT in 1982, Dr. Terzuoli was a research associate at the ElectroScience laboratory at the Ohio State University, and was a member of the technical staff at the Bell Telephone Laboratories in New Jersey. He is an active officer of IEEE, and a fellow of the Electromagnetics Academy. Tel. 937-255-3636 x4717 (DSN 785-3636 x4717), email: Andrew.Terzuoli@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

“Remote Sensing and Communications for Advanced Technical Exploitation.” Sponsor: NASIC. Funding: \$75,000.

“RF Sensing for Small Unmanned Aerial Systems (SUAS).” Sponsor: AFRL/RV. Funding: \$140,000.

“HARVEST RIMSHOT Performance and Cost Analysis.” Sponsor: SAF. Funding: \$150,000 – Terzuoli 50%, Martin 50%.

“Next Generation Radar Range (NGRR) – Outdoor.” Sponsor: AFRL/RV. Funding: \$382,000.

REFEREED JOURNAL PUBLICATIONS

M. L. Massar, M. Fickus, E. Bryan, D. T. Petkie, A. J. Terzuoli, Jr., “Fast Computation of Spectral Centroids,” Adv. Comput. Math., Vol. 35, No. 1, July 2011, pp 83-97.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

D. F. Chick, P. J. Collins, S. A. Goodman, R. K. Martin, and A. J. Terzuoli, Jr., “Direction Finding With Mutually Orthogonal Antennas,” Proceedings of the 2011 IEEE International Symposium on Antennas and Propagation and USNC/URSI National Radio Science Meeting, Spokane, WA, 3-8 July 2011.

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) CY2011: co-Chair, with Dave Bunker.

Participant in Dayton Development Coalition (DDC) Sensors Task Force.

Participant in DDC Science, Technology, Engineering, and Math (STEM) Education Summit.

THOMAS, RYAN W., Maj,

Assistant Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2007 (AFIT/ENG); BS, Engineering, Harvey Mudd College, 1999; MSCE, Air Force Institute of Technology, 2001; PhD, Computer Engineering, Virginia Tech, 2007. His research interests include cognitive networks, cognitive radio networks, wireless ad-hoc networks, game theoretic analysis and

modeling, spectrum reuse, secondary users, distributed networking protocols and security. Tel. 937-255-3636 x4613 (DSN 785-3636 x4613), email: Ryan.Thomas@afit.edu

REFEREED JOURNAL PUBLICATIONS

Juan M. Carlos Gonzalez, Kenneth M. Hopkinson, Gabriel H. Greve, Matthew D. Compton, Joseph Wilhelm, Stuart H. Kurkowski, and Ryan W. Thomas, *Optimization of Trust System Placement for Power Grid Security and Compartmentalization*, IEEE Transactions on Power Systems, May 2011, Vol. 26, No. 2, pp. 550-563.

Ryan W. Thomas, Ramakant S. Komali, Brett Borghetti and Petri Mahonen, *Understanding Conditions That Lead to Emulation Attacks in Dynamic Spectrum Access*, IEEE Communications Magazine, March 2011.

Benjamin W. Ramsey, Barry E. Mullins, Ryan W. Thomas, and Todd R. Andel, *Subjective audio quality over a secure IEEE 802.11n network*, International Journal of Security and Networks, March 2011.

Nick C. Theis, Ryan W. Thomas, and Luiz A. DaSilva, *Rendezvous for Cognitive Radio*, IEEE Transactions on Mobile Computing, February 2011.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Richard K. Martin, Ryan W. Thomas, and Zhiqiang Wu "Using Spectral Correlation For Non-Cooperative RSS-Based Positioning" Proceedings of IEEE SSP, Nice, France, June 2011.

Paul Harmer, Ryan W. Thomas, Brady Christel, Richard Martin, and Clifton Watson, "Wireless Security Situation Awareness with Attack Identification Decision Support," Proceedings of CICS 2011, Paris, France, April 2011.

Richard K. Martin, Amanda S. King, Ryan W. Thomas, and Jason Pennington, "Practical Limits in RSS-Based Positioning," in Proc. ICASSP 2011, Prague, Czech Republic, May 2011, 4 pages.

Juan Carlos Gonzalez, Kenneth Hopkinson, Gabriel Greve, Matthew Compton, Joseph Wilhelm, Stuart Kurkowski, and Ryan Thomas, *Optimization of Trust System Placement for Power Grid Security and Compartmentalization*, Proceedings of 2011 IEEE Power Society General Meeting, 2011.

TRIAS, ERIC D., Maj,

Assistant Professor of Computer Science, Department of Electrical and Computer Engineering, AFIT
Appointment Date: 2008 (AFIT/ENG), BSCS, University of California, Davis, 1998; MSCE, Air Force Institute of Technology, 2002; PhD, Computer Science, University of New Mexico, 2008. His research interests include database systems, information hiding, knowledge discovery and data mining, and digital forensics. Tel.937-255-3636 x4575 (DSN 785-3636 x4575), email: Eric.Trias@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

"Information Operations and Security Using Non-cryptographic Solutions." Sponsor: AFOSR. Funding: \$36,779.

5.3. DEPARTMENT OF ENGINEERING PHYSICS

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5.3.1. DOCTORAL DISSERTATIONS

- ANDERSON, MONTE D., *Tunable Optical Delay in Doppler-Broadened Cesium Vapor*. AFIT/DS/ENP/10-S01. Faculty Advisor: Dr. Glen P. Perram. Sponsor: HELJTO. [CDE]
- BARGER, LUKE A., *The Scattering Matrix Elements of the Nonadiabatic Collision*. AFIT/DS/ENP/10-S02. Faculty Advisor: Dr. David E. Weeks. Sponsor: AFOSR.
- BELCHER, LACHLAN T., *Gradients and Non-Adiabatic Derivative Coupling Terms for Spin-Orbit Wavefunctions*. AFIT/DS/ENP/11-J01. Faculty Advisor: Dr. David E. Weeks. Sponsor: HELJTO. [CDE]
- GORDON, JOE M., *Shock Wave Dynamics of Novel Aluminized Detonations and Empirical Model for Temperature Evolution from Post-Detonation Combustion Fireballs*. AFIT/DS/ENP/10-S03. Faculty Advisor: Dr. Glen P. Perram. Sponsor: DTRA. [CTISR]
- HOELSCHER, MARK G., *Restoration of Scene Information Reflected from Non-Specular Media*. AFIT/DS/ENP/11-M03. Faculty Advisor: Dr. Michael A. Marciniak. Sponsor: AFRL/Ry. [CDE]
- LEWIS, CHARLTON D., II, *Non-Adiabatic Atomic Transitions: Computational Cross Section Calculations of Alkali Metal-Noble Gas Collisions*. AFIT/DS/ENP/11-S04. Faculty Advisor: Dr. David E. Weeks. Sponsor: HELJTO. [CDE]
- MCHALE, STEPHEN R., *The Effects of Rare Earth Doping on Gallium Nitride Thin Films*. AFIT/DS/ENP/11-S05. Faculty Advisor: LTC John W. McClory. Sponsor: DTRA.
- WEI, JEAN W., *Optical and Electrical Characterization Melt-Grown Bulk InGaAs and InAsP*. AFIT/DS/ENP/11-M02. Faculty Advisor: Dr. Yung K. Yeo. Sponsor: AFOSR.

5.3.2. MASTER'S THESES

- ANTHONY, DAVID A., *Background and Source Term Identification in Active Neutron Interrogation Methods*. AFIT/GNE/ENP/11-M01. Faculty Advisor: Maj Benjamin R. Kowash. Sponsor: DOE.
- BEVINS, JAMES E., *Characterization of a Boron Carbide Heterojunction Neutron Detector*. AFIT/GNE/ENP/11-M02. Faculty Advisor: LTC John W. McClory. Sponsor: DTRA.
- CASTLE, BRETT C., *Memristive Properties of Thin Film Cuprous Oxide*. AFIT/GMS/ENP/11-M01. Faculty Advisor: Dr. Alex Li. Sponsor: AFRL/RI.
- DAHL, KRISTOFER R., *Combined Effects of Radio Frequency and Electron Radiation on CMOS Inverters*. AFIT/GNE/ENP/11-M03. Faculty Advisor: Dr. James C. Petrosky. Sponsor: DOE.
- DAILEY, WHITMAN T., *Ray Next Event Estimator Transport of Primary and Secondary Gamma Rays*. AFIT/GNE/ENP/11-M04. Faculty Advisor: Dr. Kirk A. Mathews. Sponsor: DOE.
- DOMM, PAUL H., *Verification of Global Assimilation of Ionospheric Measurements Gauss Markov (GAIM-GM) Model Forecast Accuracy*. AFIT/GAP/ENP/11-S01. Faculty Advisor: Lt Col Robb M. Randall. Sponsor: AFWA.
- DUGAN, CHRISTINA L., *Cathodoluminescence and Photoemission of Undoped and Mn Doped Lithium Tetraborate*. AFIT/GNE/ENP/11-M05. Faculty Advisor: Dr. Robert L. Hengehold. Sponsor: DTRA.
- DUNCAN, NICKOLAS A., *Changes to Electrical Conductivity in Irradiated Carbon Nanocomposites*. AFIT/GNE/ENP/11-M06. Faculty Advisor: LTC John W. McClory. Sponsor: DTRA.

FENTON, KENNETH R., *Assessment of the Effects of Plasma Bubbles on GAIM-GM*. AFIT/GAP/ENP/11-S02. Faculty Advisor: Dr. William F. Bailey. Sponsor: AFWA.

FOSTER, JESSE C., *Radiation Effects on the Electrical Properties of Hafnium Oxide Based MOS Capacitors*. AFIT/GNE/ENP/11-M07. Faculty Advisor: LTC John W. McClory. Sponsor: DTRA.

GUILD, ERIC M., *Diffusion of Rubidium Vapor through Hollow-Core Fibers for Gas-Phase Fiber Lasers*. AFIT/OSE/ENP/11-M01. Faculty Advisor: Dr. Glen P. Perram. Sponsor: HELJTO. [CDE]

HALSTEAD, MATTHEW R., *Characterization of the Neutron Spectrum at the Indiana University Neutron Source*. AFIT/GNE/ENP/11-M08. Faculty Advisor: Dr. James C. Petrosky. Sponsor: NSWC.

HARLEY, JACOB L., *Remote Quantification of Smokestack Total Effluent Mass Flow Rates Using Imaging Fourier-Transform Spectroscopy*. AFIT/GAP/ENP/11-M01. Faculty Advisor: Dr. Kevin C. Gross. Sponsor: NASIC. [CTISR]

HARRELL, WILLIAM L., *Directional Pair-Production Spectrometer Design for Airborne Stand-Off Detection of Special Nuclear Material*. AFIT/GNE/ENP/11-M09. Faculty Advisor: Maj Benjamin R. Kowash. Sponsor: DHS.

HOCKING, HANNAH E., *TOF-SIMS for Rapid Nuclear Forensics Evaluation of Uranium Oxide Particles*. AFIT/GNE/ENP/11-M10. Faculty Advisor: Dr. Larry W. Burggarf. Sponsor: N/A.

HURST, BENJAMIN E., *High-Energy Laser Damage Testing on Painted Metals at 1.07 μm* . AFIT/GAP/ENP/11-M02. Faculty Advisor: Dr. Michael A. Marciniak. Sponsor: HELJTO. [CDE]

JENKS, REGINA M., *Comparison of Private and Public Sector Emergency Response Structure*. AFIT/GWM/ENP/11-J01. Faculty Advisor: LTC Eugene V. Sheely. Sponsor: N/A.

JENNIGES, JANELLE V., *Sensitivity Analysis of Empirical Parameters in the Ionosphere-Plasmasphere Model*. AFIT/GAP/ENP/11-M03. Faculty Advisor: Lt Col Ariel O. Acebal. Sponsor: AFWA.

JONES, BRADLEY S., *Investigation of YAG:Ce Scintillating Fiber Properties Using Silicon Photomultipliers*. AFIT/GNE/ENP/11-M11. Faculty Advisor: Maj Benjamin R. Kowash. Sponsor: DHS.

JONES, PAUL N., *Broadband Pumping Effects on the Diode Pumped Alkali Laser*. AFIT/GAP/ENP/11-M04. Faculty Advisor: Dr. Glen P. Perram. Sponsor: HELJTO.

KANANEN, BRANT E., *Characterization of Neutron-Induced Defects in Isotopically Enriched Lithium Tetraborate*. AFIT/GNE/ENP/11-M12. Faculty Advisor: LTC John W. McClory. Sponsor: DTRA.

MASSMAN, JENNIFER L., *Understanding the Influence of Turbulence in Imaging Fourier-Transform Spectrometry of Smokestack Plumes*. AFIT/GAP/ENP/11-M05. Faculty Advisor: Dr. Kevin C. Gross. Sponsor: N/A. [CTISR]

MAY, ROSE E., *Investigation of Gate Leakage Current in Nitrogen-Irradiated AlGaIn/GaN Heterostructures*. AFIT/GNE/ENP/11-M14. Faculty Advisor: Dr. James C. Petrosky. Sponsor: DOE.

MEYER, PAUL E., *Power Law Discrimination of Electromagnetic Pulse Signals*. AFIT/GNE/ENP/11-M15. Faculty Advisor: Lt Col Jeremy C. Holtgrave. Sponsor: DOE Los Alamos National Laboratory.

MILLER, APRIL D., *A Comparison in the Accuracy of Mapping Nuclear Fallout Patterns using HPAC, HYSPLIT, DELFIC FPT and an AFIT FORTRAN95 Fallout Deposition Code*. AFIT/GNE/ENP/11-M16. Faculty Advisor: Dr. Steven T. Fiorino. Sponsor: N/A. [CDE]

MILLER, JOSHUA T., *Immediate and Delayed Drug Therapy Effects on Low Dose Sarin Exposed Mice Myocardial Performance*. AFIT/GWM/ENP/11-M03. Faculty Advisor: Dr. Charles A. Bleckmann. Sponsor: N/A.

NAVA, OMAR A., *Analysis of Plasma Bubble Signatures in the Ionosphere*. AFIT/GAP/ENP/11-M06. Faculty Advisor: Dr. William F. Bailey. Sponsor: CASS & AFWA.

NELSON, JEFFREY S., *Combating Biological Terrorism from Imported Food*. AFIT/GWM/ENP/11-M04. Faculty Advisor: Dr. Charles A. Bleckmann. Sponsor: N/A.

PALM, WILLIAM J., *Multilayer Insulation Laser Damage Characterization for Wavelength Scaling*. AFIT/GAP/ENP/11-M07. Faculty Advisor: Dr. Michael A. Marciniak. Sponsor: HELJTO & AFRL/RX. [CDE]

PURCELL, EMILY A., *Cathodoluminescence of Irradiated Hafnium Dioxide*. AFIT/GAP/ENP/11-M08. Faculty Advisor: Dr. Robert L. Hengehold. Sponsor: DTRA.

RICHARDS, MICHAEL J., *Nuclear Weapon Yield Determination through Nano Indentation of Thermally Degraded Automobile Paint*. AFIT/GNE/ENP/11-M17. Faculty Advisor: Dr. James C. Petrosky. Sponsor: DTRA.

SIMMONS, DAVID B., *Integration of a Worldwide Atmospheric Based Model with a Live Virtual Constructive Simulation Environment*. AFIT/GAP/ENP/11-M09. Faculty Advisor: Dr. Steven T. Fiorino. Sponsor: 711 HPW/RH. [CDE]

SMITH, JUSTIN M., *Source Normalization Constants for Ground Distributed Fallout Fields*. AFIT/GNE/ENP/11-S02. Faculty Advisor: Dr. Charles J. Bridgman. Sponsor: DHS.

SPENCER, MARK F., *Branch Point Mitigation of Thermal Blooming Phase Compensation Instability*. AFIT/OSE/ENP/11-M02. Faculty Advisor: Dr. Salvatore J. Cusumano. Sponsor: HELJTO. [CDE]

STEADMAN, LINDON H., *Effect of Storm Enhanced Densities on Geo-Location Accuracy Over CONUS*. AFIT/GAP/ENP/11-S03. Faculty Advisor: Lt Col Ariel O. Acebal. Sponsor: AFWA.

STEVENSON, ALEXANDER W., *Improving the Efficiency of Photon Collection by Compton Rescue*. AFIT/GAP/ENP/11-M10. Faculty Advisor: Lt Col Christopher S. Williams. Sponsor: N/A.

THOMAS, BENJAMIN R., *Neutron Detection Using Gadolinium-Based Diodes*. AFIT/GNE/ENP/11-M18. Faculty Advisor: LTC John W. McClory. Sponsor: DTRA.

VINCENT, ROBERT A., *Passive Ranging of Dynamic Rocket Plumes using Infrared and Visible Oxygen Attenuation*. AFIT/GAP/ENP/11-M11. Faculty Advisor: Lt Col Michael R. Hawks. Sponsor: NASIC. [CTISR]

WALKER, ARIELLA C., *Positron Annihilation Ratio Spectroscopy Study of Electric Fields Applied to Positronium at Material Interfaces*. AFIT/GNE/ENP/11-M19. Faculty Advisor: Dr. Larry W. Burggarf. Sponsor: AFOSR.

WILLCOX, DANIEL T., *Adaptive Imaging Methods using a Rotating Modulation Collimator (RMC)*. AFIT/GNE/ENP/11-M20. Faculty Advisor: Maj Benjamin R. Kowash. Sponsor: DTRA.

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

REFEREED JOURNAL PUBLICATIONS

Acebal, A. and Sojka, J.J., "A Flare Sensitive Three-Hour Solar Flux Radio Index for Space Weather Applications," *Space Weather Journal* 9, Article No. S07004, July 2011.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Created Energetic Particle Event forecasting tool. Software was delivered to HQ Air Force Weather Agency (AFWA) and the Space Weather Prediction Center, part of the National Oceanic and Atmospheric Administration (NOAA).

BAILEY, WILLIAM F.,

Associate Professor of Physics, Department of Engineering Physics, AFIT Appointment Date: 1978 (AFIT/ENP); BS, United States Military Academy, 1964; MS, The Ohio State University, 1966; PhD, Air Force Institute of Technology, 1978. Dr. Bailey's research interests center on weakly ionized gases and reactive kinetics with special applications to semiconductor processing in gas discharges, shock characterization in ionized flows, and solutions of the inhomogeneous electron kinetic equation. Dr. Bailey has published over 20 papers in refereed conference proceedings and international journals and chaired over 25 theses and dissertations. He is a member of Tau Beta Pi, Sigma Pi Sigma, and Sigma Xi. Tel. 937-255-3636 x4501 (DSN 785-3636 x4501), email: William.Bailey@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

"Numerical Solutions of the Kinetic Equation." Sponsor: AFRL/RB. Funding: \$35,000.

REFEREED JOURNAL PUBLICATIONS

Josyula, E., Bailey, W.F. and Suchyta, III, C.J., "Dissociation Modeling in Hypersonic Flows Using State-to-State Kinetics," *Journal of Thermophysics and Heat Transfer* 25, No. 1, pp. 34-47, Jan-Mar 2011.

Josyula, E., Vedula, P., Bailey, W.F. and Suchyta, III, C.J., "Kinetic Solution of the Structure of a Shock Wave in a Non- Reactive Gas Mixture," *Physics of Fluids* 23, Article No. 017101 (9 pages), Jan 2011.

Cusumano, S.J., Fiorino, S.T., Bartell, R.J., Krizo, M.J., Bailey, W.F., Beauchamp, R.L., and Marciniak, M.A., "Modeling bi-static spectral measurements of temporally evolving reflected and emitted energy from a distant and receding target," *Journal of Applied Remote Sensing* 5, Article No. 053549, Sep 2011. [CDE]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Palm, W.J., Marciniak, M.A., Perram, G.P., Gross, K.C., and Bailey, W.F., "Laser-induced damage of Kapton thin films demonstrating temperature and wavelength dependent absorptance: a case study in remote-sensing material analysis," Proceedings of the SPIE Laser Damage Conference, Vol. 8190, 8190-08, Sept 2011. [CDE]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Palm, W.J., Marciniak, M.A., Perram, G.P., Gross, K.C., and Bailey, W.F., "Laser-induced damage of Kapton thin films demonstrating temperature and wavelength dependent absorptance: a case study in remote-sensing material analysis," presentation at the SPIE Laser Damage Conference, Boulder, CO, 18-21 Sept 2011. [CDE]

BICKLEY, ABIGAIL A.,

Research Assistant Professor, Department of Engineering Physics, AFIT Appointment Date: 2010 (AFIT/ENP); BA, Dartmouth College, 2000; PhD, University of Maryland, 2004. Dr. Bickley's research focuses on the application of nuclear chemistry and physics to problems relevant to the field of nuclear forensics through the development of novel detection systems. She is the author of over 60 archival publications in refereed journals. Before joining AFIT, she was a faculty member for three years in the Department of Chemistry and National Superconducting Cyclotron Laboratory at Michigan State University. Her current work includes studies of solid-state semiconductor materials for detecting neutrons with applications towards detecting special nuclear materials. She is a member of the American Physical Society, American Nuclear Society, and American Chemical Society. Tel. 937-255-3636 x4586 (DSN 785-3636 x4586), email: Abigail.Bickley@afit.edu

REFEREED JOURNAL PUBLICATIONS

Richardson, E., Akiba, Y., Anderson, N., Bickley, A.A., et al., "A reaction plane detector for PHENIX at RHIC," *Nuclear Instruments and Methods in Physics Research A* 636, pp. 99-107, April 2011.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Program reviewer for DOE Office of Nonproliferation and Verification Research and Development.

Bickley, A.A., Bevins, J., McClory, J., Dowben, P., Miller, W., and Petrosky, J., "Design and testing of a boron carbide based neutron spectrometer for homeland security applications," invited presentation at the American Chemical Society Fall 2011 National Meeting, Denver, Colorado, 30 August 2011.

Bickley, A.A., McClory, J.W., Petrosky, J.C., and Dowben, P.A., "Performance evaluation of neutron detectors incorporating intrinsic Gd using a GEANT4 modeling approach," presented at the 2011 Materials Research Society Spring Conference, San Francisco, California, 25 April 2011.

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. Tel. 937-255-3636 x4957 (DSN 785-3636 x4957), email: Christoph.Borel@afit.edu

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Borel, Christoph C. and Tuttle, Ronald F., "Multi- and hyperspectral scene modeling," Proceedings of the SPIE, Vol. 7812, 78120K, 2011. [CTISR]

Borel, Christoph C., "Vegetative canopy parameter retrieval using 8-band data," Proceedings of the 2011 Geospatial World Forum, Hyderabad, India, 21 pages, 18-21 Jan 2011. [CTISR]

Borel, C. and Bunker, D., "Multi-spectral vegetative canopy parameter retrieval," Proceedings of the SPIE Remote Sensing, Vol. 8174, paper #32, 12 pages, Sept 2011. [CTISR]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Winner of one of 5 awards of \$5000 of the DigitalGlobe 8-band research challenge, December 2010, awarded by CEO Jill Smith, January 2011. Over 500 images were distributed by DigitalGlobe and over 70 papers were submitted. Dr. Borel was one of two winners from the US.

Borel, Christoph C., "Vegetative canopy parameter retrieval using 8-band data," presentation at the 2011 Geospatial World Forum, Hyderabad, India, Conference Proc., 18-21 Jan 2011. [CTISR]

Borel, Christoph C. and Tuttle, Ronald F., "Simulation of sub-pixel thermal target detection," presentation at the IEEE Aerospace Conference, Big Sky, 5-12 March 2011. [CTISR]

Borel, Christoph C. and Tuttle, Ronald F., "Recent advances in temperature emissivity separation algorithms," presentation at the IEEE Aerospace Conference, Big Sky, 5-12 March 2011. [CTISR]

Borel, Christoph C., "Methods to find sub-pixel targets in hyperspectral data," presentation at the WHISPERS 2011, Lisbon, IEEE, June 2011. [CTISR]

Borel, C., and Bunker, D., "Multi-spectral vegetative canopy parameter retrieval," presentation at the SPIE Remote Sensing, paper #32, Prague, Czech Republic, 19-22 September 2011. [CTISR]

Borel, C., Bunker, D., Walford, G., Magnus, A., Miller, L., and Tuttle, R., "Rapid Location Of Radiation Sources In Complex Environments Using Optical And Radiation Sensors," presentation at the 4th CBRNE Research & Education Collaboration Symposium, Fairborn, Ohio, 21-23 Sep 2011. [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

BUNKER, DAVID J.,

Deputy Director, Center for Technical Intelligence Studies and Research, 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

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Borel, C. and Bunker, D., "Multi-spectral vegetative canopy parameter retrieval," Proceedings of the SPIE Remote Sensing, Vol. 8174, paper #32, 12 pages, September 2011. [CTISR]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

2011, Co-Chair of the Wright-Patterson MASINT/AGI Development Consortium.

Borel, C., and Bunker, D., "Multi-spectral vegetative canopy parameter retrieval," presentation at the SPIE Remote Sensing, paper #32, Prague, Czech Republic, 19-22 September 2011. [CTISR]

Borel, C., Bunker, D., Walford, G., Magnus, A., Miller, L., and Tuttle, R., "Rapid Location Of Radiation Sources In Complex Environments Using Optical And Radiation Sensors," presentation at the 4th CBRNE Research & Education Collaboration Symposium, Fairborn, Ohio, 21-23 Sep 2011. [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, 1994. Dr. Burggraf conducts experimental and theoretical research in surface spectroscopy, atomic force microscopy, positron spectroscopy, and gamma spectroscopy to solve DOD and DOE problems in various areas, including nano-materials; chemical, biochemical, and nuclear non-proliferation; radiation imaging; and nuclear fuels chemistry. Dr. Burggraf's research currently applies positron spectroscopy, gamma spectroscopy, photoluminescence spectroscopy, infrared spectroscopy, Raman spectroscopy, and atomic force microscopy to problems in solid-state physics and detection and non-proliferation of nuclear, chemical, and biological weapons. Theoretical research to model surfaces and clusters centers on applying quantum mechanics models to interpret experimental results. Dr. Burggraf has more than 40 publications. Tel. 937-255-3636 x4507 (DSN 785-3636 x4507), email: Larry.Burggraf@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

"Chemical Explosive Dynamics and Effects on Bacillus anthracis." Sponsor: DTRA. Funding: \$209,882.

"Modeling and Measurement of Positron Chemistry: Application to Clusters and Defects." Sponsor: AFOSR. Funding: \$40,000.

REFEREED JOURNAL PUBLICATIONS

Li, Alex G. and Burggraf, Larry W., "Glass transitions in small heated volumes in thin polystyrene films," *Review of Scientific Instruments* 81, Article No. 123707 (11 pages), Dec 2010.

Williams, C.S., Burggraf, L.W., Adamson, P.E., and Petrosky, J.C., "Optimization of three-dimensional positron annihilation spectroscopy system (3DPASS) for three-dimensional momentum measurements,"

Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment 629, p. 175, Feb 2011.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Williams, C., Burggraf, L., Adamson, P., Petrosky J., “Three-dimensional Electron-Positron Momentum Distribution Of O^{3+} -Irradiated 6H SiC Using Two Positron Spectroscopy Techniques Simultaneously,” *Journal of Physics: Conference Series*, Vol. 262, Article No. 012064, pp. 1-5, 2011.

Sheely, Eugene V., Burggraf, Larry W., Adamson, Paul E., Duan Xiofeng F., and Schmidt, Mike W., “Application of GAMESS/NEO to quantum calculations of muonic molecules,” *Journal of Physics: Conference Series*, Vol. 225, Article No. 12049, 2010.

Williams, C., Duan, X., Petrosky, J., Burggraf, L., “Oxygen-atom Defects in 6H Silicon Carbide Implanted Using 24 MeV O^{3+} Ions Measured Using Three-dimensional Positron Annihilation Spectroscopy System (3DPASS),” *AIP Conference Proceedings*, Vol. 1336, pp. 458-464, May 2011.

Mock, Todd Anthony, Sjoden, Glenn, Petrosky, James, and Burggraf, Larry, “Evaluation of Material Response to Thermal Flash,” *Hardened Electronics and Radiation Technology Conference 2011*, Proceedings Paper No. M.5, 2011.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Burggraf, L. W., "Positron Chemistry at AFIT," Wright State University, Chemistry Department Seminar Series, October 29, 2010.

Burggraf, L. W., "Positron Chemistry at AFIT," State University of New York-Buffalo, Chemistry Department Seminar, 14 January 2011.

Tucker Stachitas, Glenn Sjoden, James Petrosky, Larry Burggraf, Todd Mock, “Evaluation of 3-D Radiant Heat Transfer in Street Canyons,” presented at the Hardened Electronics and Radiation Technology Conference, 31 Mar 11, Orlando, FL.

Mock, Todd A., Sjoden, Glenn, Petrosky, James, Burggraf, Larry, “Evaluation Of Material Response To Thermal Flash,” presented at the Hardened Electronics and Radiation Technology Conference, Orlando, FL, 31 Mar 2011.

Burggraf, L. W., "Positron Chemistry at AFIT," AFOSR Molecular Dynamics Contractors' Meeting, Poster Session presentation, Pasadena, CA, 17 May 2011.

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. Tel. 937-255-3636 x7294 (DSN 785-3636 x7294), email: Salvatore.Cusumano@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

“Tactical High Energy Laser Weapon Alignment System Architecture Efficiencies.” Sponsor: HELJTO. Funding: \$89,700. [CDE]

“Airborne Aero-Optic Laboratory.” Sponsor: AFRL/RD. Funding: \$149,480. [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]

“Beam Control for Optical Phased Array Weapons.” Sponsor: AFOSR. Funding: \$29,958. [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]

REFEREED JOURNAL PUBLICATIONS

Cusumano, S.J., Fiorino, S.T., Bartell, R.J., Krizo, M.J., Bailey, W.F., Beauchamp, R.L., and Marciniak, M.A., “Modeling bi-static spectral measurements of temporally evolving reflected and emitted energy from a distant and receding target,” *Journal of Applied Remote Sensing* 5, Article No. 053549 (2 Sep 2011). [CDE]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Leakeas, Charles L., Capehart, Shay R., Bartell, Richard J., Cusumano, Salvatore J., and Whiteley, Matthew R., “Performance modeling of the effects of aperture phase error, turbulence, and thermal blooming on tiled subaperture systems,” *Proceedings of the SPIE Atmospheric Propagation VIII*, Vol. 8038, Paper No. 803803 (May 2011). [CDE]

Spencer, Mark F. and Cusumano, Salvatore J., “Impact of branch points in adaptive optics compensation of thermal blooming and turbulence,” *Proceedings of the SPIE*, Vol. 8165, Paper No. 816503 (September 2011). [CDE]

BOOKS AND CHAPTERS IN BOOKS

Perram, G.P., Cusumano, S.J., Hengehold, R.L., and Fiorino, S.T., *An Introduction to Laser Weapon Systems* (Directed Energy Professional Society, Oct 2010), 463 pp. [CDE]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Fiorino, S.T., Randall, R.M., Downs, A.D., Bartell, R.J., Krizo, M.J., and Cusumano, S.J., “Three-Dimensional Optical Turbulence Assessments from Doppler Weather Radar for Laser Applications,” presentation at the 6th DEPS Systems Symposium, Monterey CA, 28 March -1 April 2011. [CDE]

Fiorino, S.T., Randall, R.M., Downs, A.D., Bartell, R.J., Krizo, M.J., and Cusumano, S.J., “Three-dimensional optical turbulence assessments from doppler weather radar for laser applications” (Poster), 15th Symposium on Integrated Observing and Assimilation Systems for the Atmosphere, Oceans and Land Surface (IOAS-AOLS), 91st Annual American Meteorological Society Meeting, Seattle, WA, 23-27 January 2011. [CDE]

Fiorino, S.T., Randall, R.M., Krizo, M.J., Bartell, R.J., Woyak, J., and Cusumano, S.J., “Development of a High Energy Laser Tactical Decision Aid (HELTDA) for Mission Planning and Predictive Avoidance,” presentation at the Directed Energy Professional Society 13th Annual DE Symposium, Bethesda MD (15-19 November 2010). [CDE]

Spencer, M.F., Cusumano, S.J., Schmidt, J.D., and Fiorino, S.T., “Impact of temporal resolution on thermal blooming phase compensation instability,” presentation at the Directed Energy Professional Society 13th Annual DE Symposium, Bethesda MD (15-19 November 2010). [CDE]

FIORINO, STEVEN T.,

Research Associate Professor of Atmospheric Physics, AFIT Appointment Date: 2003 (AFIT/ENP); BS, Geography (Climatology), The Ohio State University, 1987; BS, Meteorology, Florida State University, 1989; MS, Atmospheric Dynamics, The Ohio State University, 1993; PhD, Physical Meteorology, Florida State University, 2002. Dr. Fiorino's research interests include retrieving environmental parameters via microwave remote sensing; developing signal processing algorithms to fuse meteorological data collection with non-weather ISR platforms; evaluating uncertainty in high-energy laser engagement due to atmospheric effects; and improving microphysical characterizations for nuclear fallout, transport, and dispersion. He has published broadly in meteorological, directed energy, and military journals. Dr. Fiorino is a member of the American Meteorological Society, American Institute of Aeronautics and Astronautics, and Directed Energy Professional Society and, additionally, holds a Master of Military Operational Art and Science from Air University (2003). Tel. 937-255-3636 x4506 (DSN 785-3636 x4506), email: Steven.Fiorino@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

"Modification of AFIT Atmospheric Effects Software Code for AFRL/RV." Sponsor: AFMC. Funding: \$105,217 – Fiorino 45%, Cusumano 45%, Randall 10%. [CDE]

"CY2011 HEL JTO M&S TAWG Product Development." Sponsor: HELJTO. Funding: \$537,500 – Fiorino 55%, Cusumano 45%. [CDE]

"2011 AFIT Center for Directed Energy Summer Intern (DESI) Program." Sponsor: HELJTO. Funding: \$50,000 – Fiorino 55%, Cusumano 45%. [CDE]

"High Energy Laser-Joint Technology Office Contracting Officer Technical Representative." Sponsor: HELJTO. Funding: \$6,864. [CDE]

"LEEDR Backscatter Code & Implementation." Sponsor: AFRL/RV. Funding: \$10,000. [CDE]

SPONSOR FUNDED EDUCATIONAL PROJECTS

"Atmospheric Effects & Software Codes Short Course." Sponsor: AFRL/RV. Funding: \$7,900 – Fiorino 95%, Randall 5%. [CDE]

REFEREED JOURNAL PUBLICATIONS

Cusumano, S.J., Fiorino, S.T., Bartell, R.J., Krizo, M.J., Bailey, W.F., Beauchamp, R.L., and Marciniak, M.A., "Modeling bi-static spectral measurements of temporally evolving reflected and emitted energy from a distant and receding target," *Journal of Applied Remote Sensing* 5, Article No. 053549, Sept 2011. [CDE]

Fiorino, S.T., Randall, R.M., Bartell, R.J., Downs, A., Chu, P., and Fan, C.W., "Climate Change: Anticipated Effects on High Energy Laser Weapon Systems in Maritime Environments," *Journal of Applied Meteorology and Climatology* 50, No. 1, pp. 153-166, Jan 2011. [CDE]

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Randall, R.M., Fiorino, S.T., Via, M.F., and Downs, A.D., "Validation of Technique to Hyperspectrally Characterize the Lower Atmosphere with Limited Surface Observations," *Proceedings SPIE*, Vol. 8038, Article No. 803807, 2011. [CDE]

BOOKS AND CHAPTERS IN BOOKS

Perram, G.P., Cusumano, S.J., Hengehold, R.L., and Fiorino, S.T., *An Introduction to Laser Weapon Systems* (Directed Energy Professional Society, Oct 2010), 463 pp. [CDE]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Past President, Wright Memorial Chapter of the American Meteorological Society, 1 Oct 10 – 30 Sep 11.
Contracting Officer Representative for the Analytic Model for the Adaptive Optical Compensation for Thermal Blooming (AOTB) HELJTO BAA, 1 Oct 10 – 30 Sep 11. [CDE]

Via, M.F., Randall, R.M., Fiorino, S.T., and Downs, A.D., “Surface Observations Input and Band Model Validation in LEEDR Atmospheric Characterization Package,” presented at the 33rd Review of Atmospheric Transmission Models Meeting, Lexington, MA, 15 June 2011. [CDE]

Fiorino, S.T., Randall, R.M., Downs, A.D., Bartell, R.J., Krizo, M.J., and Cusumano, S.J., “Three-Dimensional Optical Turbulence Assessments from Doppler Weather Radar for Laser Applications,” presented at the 6th DEPS Systems Symposium, Monterey CA, 28 March-1 April 2011. [CDE]

Beauchamp, R.L. and Fiorino, S.T., “Propagation of Laser Light Through Aero-Optical Flow: Preliminary Investigation of Moist Air with Aerosols,” presented at the 6th DEPS Systems Symposium, Monterey CA, 28 March -1 April 2011. [CDE]

Fiorino, S.T., Randall, R.M., Downs, A.D., Bartell, R.J., Krizo, M.J., and Cusumano, S.J., “Three-dimensional optical turbulence assessments from doppler weather radar for laser applications” (Poster), 15th Symposium on Integrated Observing and Assimilation Systems for the Atmosphere, Oceans and Land Surface (IOAS-AOLS), 91st Annual American Meteorological Society Meeting, Seattle, WA, 23-27 January 2011. [CDE]

Randall, R.M., Herman, B.M., and Fiorino, S.T., “Temporal Variability of the Atmospheric Zero Trend Level” (Poster), 23rd Conference on Climate Variability and Change, 91st Annual American Meteorological Society Meeting, Seattle WA, 23-27 January 2011. [CDE]

Fiorino, S.T., Randall, R.M., Krizo, M.J., Bartell, R.J., Woyak, J., and Cusumano, S.J., “Development of a High Energy Laser Tactical Decision Aid (HELTDA) for Mission Planning and Predictive Avoidance,” presented at the Directed Energy Professional Society 13th Annual DE Symposium, Bethesda MD, 15-19 November 2010. [CDE]

Spencer, M.F., Cusumano, S.J., Schmidt, J.D., and Fiorino, S.T., “Impact of temporal resolution on thermal blooming phase compensation instability,” presentation at the Directed Energy Professional Society 13th Annual DE Symposium, Bethesda MD (15-19 November 2010). [CDE]

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 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. Tel. 937-255-3636x4693 (DSN 785-3636x4828), email: 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 over 165 archival publications in refereed journals. Before joining AFIT, she was a physics faculty member at West Virginia University for 19 years. Her current work includes studies of scintillator materials (ZnO:Ga, CdWO₄) for improved detection of nuclear radiation, wide band-gap semiconductors, and infrared non-linear optical materials for infrared countermeasures. Member of

the Optical Society of America, American Physical Society, and Materials Research Society. Tel. 937-255-3636 x4601 (DSN 785-3636 x4601), email: Nancy.Giles@afit.edu

REFEREED JOURNAL PUBLICATIONS

Brant, A.T., Yang, Shan, Giles, N.C., Iqbal, Zafar, Mannivannan, M.A., Halliburton, L.E., "Oxygen vacancies adjacent to Cu^{2+} ions in TiO_2 (rutile) crystals," *Journal of Applied Physics* 109, Article No. 073711 (7 pages) (2011).

Brant, A.T., Yang, Shan, Giles N.C., Halliburton, L.E., "Hydrogen donors and Ti^{3+} ions in reduced TiO_2 crystals," *Journal of Applied Physics* 110, Article No. 053714 (7 pages) (2011).

GROSS, KEVIN C.,

Assistant Professor of Physics, Department of Engineering Physics, AFIT Appointment Date: 2008 (AFIT/ENP); BS, Wright State University, 1998; MS, Wright State University, 2001; PhD, Air Force Institute of Technology, 2007. Dr. Gross' research is currently focused on the remote sensing of chemically evolving systems in the battlespace (detonation fireballs, muzzle flashes, rocket and jet engine plumes, smokestack effluents, etc.) using hyperspectral, spectroscopic, radiometric, and high-speed imagery techniques. Interests also include instrumentation development and methods for decoupling atmospheric attenuation from source emission in spectroscopic measurements of remote targets. He has advised five MS students, co-advised three PhD students, and received several research grants during his first three years on the AFIT faculty. Tel: 937-255-3636 x4558 (DSN 785-3636 x4558), email: Kevin.Gross@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

"NASIC Ground Truth Support." Sponsor: NASIC. Funding: \$140,000 – Gross 80%, Perram 10%, Tuttle 10%. [CTISR]

"Real-time Remote Detection of HR-VOC Content in Flares Phase II & III." Sponsor: DOE. Funding: \$68,072 – Gross 70%, Branam 20%, Perram 10%.

"Imaging Fourier-Transform Spectro-Photometric Characterization of an Extended Blackbody Source." Sponsor: SAF. Funding: \$30,249.

REFEREED JOURNAL PUBLICATIONS

Gross, K.C., Bradley, K.C., Perram, G.P., "Remote identification and quantification of industrial smokestack effluents via imaging Fourier-transform spectroscopy," *Environmental Science and Technology*, Vol. 44, pp. 9390-9397, Nov 2010. [CTISR]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Gross, K.C., Tremblay, P., and Chamberland, M., "IFTS for Turbulent Flow Field Diagnostics," Fourier Transform Spectroscopy, OSA Technical Digest (CD) (Optical Society of America, 2011), paper FTuD1. <http://www.opticsinfobase.org/abstract.cfm?URI=FTS-2011-FTuD1>.

Harley, Jacob L. and Gross, Kevin C. "Remote quantification of smokestack effluent mass flow rates using imaging Fourier-transform spectrometry," Proceedings of the SPIE, Vol. 8018, Article No. 801813, 2011. <http://dx.doi.org/10.1117/12.883193>. [CTISR]

Massman, Jennifer L. and Gross, Kevin C., "Understanding the influence of turbulence in imaging Fourier-transform spectroscopy of smokestack plumes," Proceedings of the SPIE, Vol. 8048, Article No. 80480A, 2011. <http://dx.doi.org/10.1117/12.883197>.

Anderson, Joel R., Hawks, Michael R., Gross, Kevin C., Perram, Glen P., "Flight test of an imaging O2 (X-b) monocular passive ranging instrument," Proceedings of the SPIE, Vol. 8020, Article No. 802005, 2011. <http://dx.doi.org/10.1117/12.883484>. [CTISR]

Gordon, Joe Motos, Gross, Kevin C., Perram, Glen P., "Empirical model for the temporally resolved temperatures of post-detonation fireballs for aluminized high explosives," Proceedings of the SPIE, Vol. 8018, Article No. 80181M, 2011. <http://dx.doi.org/10.1117/12.883515>. [CTISR]

Steward, Bryan J., Gross, K., and Perram, Glen P., "Reduction of optically observed artillery blast wave trajectories using low dimensionality models," Proceedings of the SPIE, Vol. 8020, pp. 80200D, 2011. <http://dx.doi.org/10.1117/12.883524>. [CTISR]

Savary, S., Gagnon, J.P., Gross, K.C., Tremblay, P., Chamberland, M., and Farley, M., "Standoff identification and quantification of flare emissions using infrared hyperspectral imaging," Proceedings of the SPIE, Vol. 8024, Article No. 80240T, 2011. <http://dx.doi.org/10.1117/12.884342>.

Steward, Bryan J., Gross, Kevin C., Perram, Glen P., "Optical Characterization of Artillery Blast Waves," *Defense Security Symposium*, Vol. 8020, Article No. 80200D, April 2011. <http://doi:10.117/12.883524> [CTISR]

Rhoby, M. R., Harley, J.L., and Gross, K.C., "IFTS measurements of a laboratory scale laminar flame," Proceedings of the SPIE 8158, Article No. 81580P, August 2011. <http://dx.doi.org/doi:10.1117/12.897238>.

Palm, W.J., Marciniak, M.A., Perram, G.P., Gross, K.C., and Bailey, W.F., "Laser-induced damage of Kapton thin films demonstrating temperature and wavelength dependent absorptance: a case study in remote-sensing material analysis," Proceedings of the SPIE Laser Damage Conference, Vol. 8190, 8190-08, Sept 2011. [CDE]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Panfili, R., Vujkovic-Cvijin, P., Xiaofeng, T., Kennett, R., Taylor, R., Dothe, H., Bernstein, L., Smith, P., Thornock, J., Gross, K., and Seebold, J., "Remote Detection of Volatile Organic Compound Emissions from Combustion Flares," presentation at the 33rd Review of Atmospheric Transmission Models Meeting, Lexington, MA, 14-16 June 2011.

Steward, Bryan J., Gross, Kevin C., and Perram, Glen P., "Optical Characterization of Artillery Blast Waves," presentation at the Defense Security Symposium, Orlando, Florida, April 2011. [CTISR]

Palm, W.J., Marciniak, M.A., Perram, G.P., Gross, K.C., and Bailey, W.F., "Laser-induced damage of Kapton thin films demonstrating temperature and wavelength dependent absorptance: a case study in remote-sensing material analysis," presentation at the SPIE Laser Damage Conference, Boulder, CO, 18-21 Sept 2011. [CDE]

Gross, K.C., Marciniak, M.A., and Perram, G.P., "Imaging Fourier Transform spectrometry as a novel tool for laser lethality," presentation at the Directed Energy Systems Symposium, Monterey, California, March 2011. [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.

REFEREED JOURNAL PUBLICATIONS

Hager, Gordon D., and Perram, Glen P., "A three level analytic model for alkali vapor lasers: Part I. Narrow band optical pumping," *Applied Physics B*, 101, pp. 45-56, Oct 2010.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Jones, P., Hager, G.D., Perram, G.P., "Influence of Broadband Excitation on the Performance of Diode Pumped Alkali Laser" *42nd AIAA Plasmadynamics and Lasers Conference*, AIAA-291-4002 June 2011, Honolulu, Hawaii. [CDE]

HAWKS, MICHAEL R., Lt Col,

Assistant Professor of Optical Engineering, Department of Engineering Physics, AFIT Appointment Date: 2008 (AFIT/ENP); BS, Astrophysics, Michigan State University, 1991; MS, Engineering Physics, AFIT, 1993; PhD, Optical Sciences, AFIT, 2005. Lt Col Hawks' main research interests include electro-optic and infrared (EO/IR) remote sensing. Specific application areas include monocular passive ranging and hyperspectral and polarimetric imaging. He previously taught at the 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

SPONSOR FUNDED RESEARCH PROJECTS

"Enhanced Monocular Passive Ranging Methods." Sponsor: NASIC. Funding: \$36,500. [CTISR]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Vincent, R.A. and Hawks, M., "Passive ranging of dynamic rocket plumes using infrared and visible oxygen attenuation," *Proceedings of the SPIE*, Vol. 8052, Article No. 80520D, 2011. [CTISR]

Anderson, Joel R., Hawks, Michael R., Gross, Kevin C., Perram, Glen P., "Flight test of an imaging O2(X-b) monocular passive ranging instrument," *Proceedings of the SPIE*, Vol. 8020, Article No. 802005, 2011. [CDE]

Hawks, M., Anderson, J., Vincent, R.A., and MacDonald, D., "Range estimation from atmospheric absorption spectra," *Proceedings of Military Sensing Symposium (MD-SEA)*, Paper No. 10-060, ED14 Orlando, FL, 2010. [CDE]

HENGHELD, ROBERT L.,

Professor of Physics, Department of Engineering Physics, AFIT Appointment Date: 1961 (AFIT/ENP); AB, Thomas More College, 1956; MS, University of Cincinnati, 1961; PhD, University of Cincinnati, 1965. Professor Hengehold's research areas center around experimental solid state physics, semiconductor physics, optical diagnostics, and electron and laser spectroscopy. He is the author of over 100 archival publications and over 215 presentations at technical meetings. He has served as advisor on over 17 doctoral dissertations and 80 master's theses. He is currently carrying out studies of (1) depth resolved cathodoluminescent spectroscopy of materials suitable for neutron absorbing semiconductor solid state detectors and (2) optical characterization of compound semiconductor materials and superlattice structures for mid-infrared diode lasers and detectors. This work involves collaborative efforts with the Directed Energy and Sensors Directorates at AFRL and DTRA. He received the Air University Commander's Award for Faculty Achievement in 1982, the Gage H. Crocker Outstanding Professor Award in 1996, the Outstanding Professional Achievement Award from the Affiliate Society Council of the Engineering and Science Foundation of Dayton in 1997, and the General Bernard A. Schriever Award in 1999. He was elected a Fellow of the American Physical Society in 2008. Tel. 937-255-3636 x4502 (DSN 785-3636 x4502), email: Robert.Hengehold@afit.edu

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Wei, J., Barnes, J., Guha, S., Gonzalez, L.P., Yeo, Y.K., Hengehold, R.L., and Rajagopalan, G., "Electrical and Optical Characterization of Melt Grown Bulk $\text{InAs}_{1-y}\text{Py}$ Crystals," *Journal of Electronic Materials* 40, pp. 103-108, Feb 2011.

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HOLTGRAVE, JEREMY C., Lt Col,

Assistant Professor of Physics and Deputy Head, Department of Engineering Physics, AFIT Appointment Date: 2007 (AFIT/ENP); BS, Physics, University of Illinois, 1990; MS, Engineering Physics, Air Force Institute of Technology, 1992; PhD, Physics, Air Force Institute of Technology, 2003. Lt Col Holtgrave's main research interests include atomic and molecular physics with applications to the area of directed energy weapons. He also conducts classified research with space-based nuclear detonation detection sensors in collaboration with the Los Alamos National Laboratory. Tel. 937-255-3636 x4649 (DSN 785-3636 x4649), email: Jeremy.Holtgrave@afit.edu

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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

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LI, ALEX GUANGMING,

Research Assistant Professor, Department of Engineering Physics, AFIT Appointment Date: 1995 (Research Associate), 2008 (Research Faculty); PhD, Materials Science, 1990, Chinese Academy of Sciences at Shanghai Institute of Optics and Fine Mechanics; MS, Materials Science, 1987, Chinese Academy of Sciences at Shanghai Institute of Optics and Fine Mechanics; BS, Materials Science, 1982, Changchun University of Science and Technology. His current research interests include developing AFM techniques for measuring nanometer-scale thermal and mechanical properties and generating nano-patterns at elevated temperatures for photonic and electro-optic applications. He has invented a novel AFM nano-patterning technique for producing sub-100 nm nanostructures in polymers. He has authored over two dozen archival publications in refereed journals. Additional research involves laser processing and characterizing surface morphologies of glasses, ceramics, semiconductors, polymers, nano-carbon composites, and biological spores using AFM, SEM, TEM, optical interferometer, and optical microscopes and identifying and analyzing chemical compositions and structures using FTIR, Raman (micro-Raman), photoluminescence, EPR, XPS, ESCA, SEM, TEM, and XRD. Tel. 937-255-3636 x4576 (DSN 785-3636 x4576), email: Alex.Li@afit.edu

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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. Maj Magnus has published 11 articles and is writing a book on machine intelligence. Tel. 937-255-3636 x4555 (DSN 785-3636 x4555), email: Amy.Magnus@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

“Query Driven Learning Environments.” Sponsor: AFOSR. Funding: \$50,000.

“3D Site and Feature Models for a Physics Based Approach to Wide Area Sense Making.” Sponsor: AFRL/RY. Funding: \$122,669 – Magnus 37%, Walli 37%, Jackson 10%, Bunker 6%, Borel-Donohue 10%. [CTISR]

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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

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SPONSOR FUNDED RESEARCH PROJECTS

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MATHEWS, KIRK A.,

Professor of Nuclear Engineering, Department of Engineering Physics, AFIT Appointment Date: 1987 (AFIT/ENP); BS, California Institute of Technology, 1971; MS, Air Force Institute of Technology, 1982; PhD, Air Force Institute of Technology, 1983. Dr. Mathews' research interests center on computational methods for neutral particle radiation transport and modeling and analysis of nuclear phenomena and measurements, including enrichment cascade modeling, high altitude radiation transport, blast and shock, nuclear thermal radiation, deconvolution of radiation spectra, and statistical analysis of nuclear measurements. Dr. Mathews has published 20 papers in refereed journals and 21 conference proceedings and chaired 35 theses and 13 dissertations. He is a member of the American Nuclear Society and Tau Beta Pi. Tel. 937-255-3636 x4508 (DSN 785-3636 x4508), email: Kirk.Mathews@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

"Algorithm Development for AFTAC/THD 2011." Sponsor: AFTAC. Funding: \$30,000.

"Consulting Support for AFTAC/TMN 2011." Sponsor: AFTAC. Funding: \$50,000.

McCLORY, JOHN W., LTC,

Assistant Professor of Nuclear Engineering, Department of Engineering Physics, AFIT Appointment Date: 2008 (AFIT/ENP); BS, Physics, Rensselaer Polytechnic Institute, 1984; MS, Physics, Texas A&M University, 1993; PhD, Nuclear Engineering, Air Force Institute of Technology, 2008. LTC McClory's expertise is in radiation effects on electronic devices, semiconductor device characterization, radiation detector development, and nuclear weapon effects. His research includes using combinations of electrical, optical, and absorption spectroscopy to gain information on the damaging effects of ionizing and non-ionizing radiation on narrow and wide band gap materials. It also includes the interaction of radiation with matter, particularly focused on the characterization and improvement of nuclear radiation detectors. He is currently the advisor of five MS and two PhD students. LTC McClory is a liaison officer from the Defense Threat Reduction Agency and the Senior United States Army representative at AFIT. Tel. 937-255-3636 x7308 (DSN 785-3636 x7308), email: John.McClory@afit.edu

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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. LTC McHale's research interests include surface electronic structure of semiconductors, electron spectroscopy, and solid state semiconductor materials for detecting neutrons with applications towards detecting special nuclear material. Tel. 937-255-3636 x4438 (DSN 785-3636 x4438), email: Stephen.McHale@afit.edu

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McHale, S.R., McClory, J.W., Petrosky, J.C., Wu, J., Rivera, A., Martinez, A., Palai, R., Dowben, P.A., and Losovyj, Ya.B., "Schottky Barrier Formation Between Au and Rare-Earth Doped GaN Thin Films," *European Physical Journal: Applied Physics* 55, No. 3, Article No. 31301, August 2011.

Estep, N.A., McHale, S.R., McClory, J.W., Petrosky, J.C., "Ionizing Radiation Effects on CMOS HEX Inverter Performance," *Journal of Radiation Effects*, Vol. 29, No. 1, pp 41-50, Mar 2011.

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

C. L. Dugan, R. L. Hengehold, S. R. McHale, Ya. Losovyj, J. W. McClory, and J. C. Petrosky, "Photoemission and Cathodoluminescence of Doped Lithium Tetraborate Crystals Being Developed for Neutron Detection," Material Research Society Symposium Proceedings, Vol. 1341-Nuclear Radiation Detection Materials, mrs11-1134-u07-10 (6 pages), July 2011.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

McHale, S.R., McClory, J.W., Petrosky, J.C., Wu, J., Rivera, A., Martinez, A., Palai, R., Dowben, P.A., and Losovyj, Ya.B., "Schottky Barrier Formation Between Au and Rare-Earth Doped GaN Thin Films," presented at the American Vacuum Society Symposium, Albuquerque, NM, 17 Oct 2010.

McHale, S.R., McClory, J.W., Petrosky, J.C., Wu, J., Rivera, A., Martinez, A., Palai, R., Dowben, P.A., and Losovyj, Ya. B., "Photoemission Studies of Au-Gd_xGa_{1-x}N Schottky Barrier Formation," presented at the Materials Research Society Fall Meeting, Boston, MA, 3 Dec 2010.

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

SPONSOR FUNDED RESEARCH PROJECTS

"Merging Hyperspectral Imagery and Multi-Scale Modeling for Laser Lethality." Sponsor: AFRL/RD. Funding: \$165,000 – Perram 80%, Marciniak 20%. [CDE]

"High Power Diode Pumped Alkali Vapor Lasers and Analog Systems." Sponsor: AFRL/RD. Funding: \$411,336 – Perram 60%, Marciniak 20%, Gross 20%. [CDE]

"Validated Atmospheric Propagation for Diode Pumped Alkali Lasers." Sponsor: HELJTO. Funding: \$70,000. [CDE]

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Pitz, G.A., Fox, C.D., and Perram, G.P., "Collisional energy transfer between the cesium 6²P_{1/2,3/2} levels by H₂, HD, D₂, CH₄, C₂H₆, CF₄, and C₂F₆" *Physical Review A* 84, Article No. 032708 (September 2011). [CDE]

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- Thornton, D.E., Phillips, G.T., and Perram, G.P., "Velocity changing collisions in the laser saturation spectra of $^{87}\text{Rb D}_2 \text{ F}^{\nu=2}$," *Optics Communications* 284, 2890-2894, June 2011. [CDE]
- Gross, K.C., Bradley, K.C., and Perram, G.P., "Remote identification and quantification of industrial smokestack effluents via imaging Fourier-transform spectroscopy," *Environmental Science and Technology*, Vol. 44, Pgs. 9390-9397, Nov 2010. [CTISR]
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- Hager, G.D. and Perram, G.P., "A three level analytic model for alkali vapor lasers: Part I. Narrow band optical pumping," *Applied Physics B*, Vol. 101, Pgs. 45-56, Oct 2010. [CDE]
- Sulham, C.V., Pitz, G.A., and Perram, G.P. "Blue alkali lasers pumped by two photon absorption" *Applied Physics B*, Vol. 101, Pgs. 57-63, Oct 2010. [CDE]

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- Gallagher, J.A. and Perram, G.P., "Two-Photon Pumped Alkali Lasers" 42nd *AIAA Plasmadynamics and Lasers Conference*, AIAA-2011-4005 June 2011, Honolulu, Hawaii. [CDE]
- Brown, Kirk A., Hurd, Edward J., and Perram, Glen P., "Stimulated Raman Scattering in Pulsed Excitation of Potassium" 42nd *AIAA Plasmadynamics and Lasers Conference*, AIAA-2011-3458 June 2011, Honolulu, Hawaii. [CDE]
- Jones, P., Hager, G.D., and Perram, G.P., "Influence of Broadband Excitation on the Performance of Diode Pumped Alkali Laser" 42nd *AIAA Plasmadynamics and Lasers Conference*, AIAA-291-4002 June 2011, Honolulu, Hawaii. [CDE]
- Steward, B.J., Gross, K.C., and Perram, G.P., "Optical Characterization of Artillery Blast Waves," *Defense Security Symposium*, Vol. 8020, 80200D doi:10.1117/12.883524 Orlando, Florida, April 2011, Orlando, FL. [CDE]
- Anderson, Joel R., Hawks, Michael R., Gross, Kevin C., and Perram, Glen P., "Flight test of an imaging O2 (X-b) monocular passive ranging instrument," *Proc. SPIE*, Vol. 8020, pp. 802005 (2011). <http://dx.doi.org/10.1117/12.883484>. [CDE]
- Gordon, Joe Motos, Gross, Kevin C., and Perram, Glen P., "Empirical model for the temporally resolved temperatures of post-detonation fireballs for aluminized high explosives," *Proc. SPIE*, Vol. 8018, pp. 80181M (2011). <http://dx.doi.org/10.1117/12.883515>. [CDE]
- Rice, C.A. and Perram, G.P., "A tunable diode laser absorption system for long path atmospheric transmission and high energy laser applications." *Photonics West, SPIE* Vol. 7924, Article No. 7924-19, Jan 2011, San Francisco, California. [CDE]
- Brown, K.C., and Perram, G.P., "Cesium laser operating in the blue by direct optical excitation of the $7\text{ }^2\text{P}_{3/2}$ state," *Photonics West, SPIE* Vol. 7915, Article No. 7915-6, Jan 2011, San Francisco, California. [CDE]
- Anderson, M.D., and Perram, G.P., "Tunable optical delay hole burning and ground state depletion effects in cesium vapor" *Photonics West, SPIE* Vol. 7949, Article No. 7949-29, Jan 2011, San Francisco, California. [CDE]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Roberts, C.D., Marciniak, M.A., Perram, G.P., Huegen, T., “Pulsed ablation of carbon/graphite surfaces and development of plume-kinetics model,” presentation at the *SPIE Laser Damage*, 18-21 Sept 2011, Boulder, CO. [CDE]

Palm, W.J., Marciniak, M.A., Perram, G.P., Gross, K.C., Bailey, W.F., “Laser-induced damage of Kapton thin films demonstrating temperature and wavelength dependent absorptance: a case study in remote-sensing material analysis,” presentation at the *SPIE Laser Damage*, 18-21 Sept 2011, Boulder, CO. [CDE]

Gross, K.C., Marciniak, M.A., Perram, G.P., “Imaging Fourier Transform spectrometry as a novel tool for laser lethality,” presentation at the *Directed Energy Systems Symposium*, Directed Energy Professional Society, March 2011, Monterey, California. [CDE]

Palm, W.J., Marciniak, M.A., Perram, G.P., “Multilayer insulation laser damage characterization for wavelength scaling,” presentation at the *Directed Energy Systems Symposium*, Directed Energy Professional Society, March 2011, Monterey, California. [CDE]

Hurst, B., Marciniak, M.A., Perram, G.P., “Laser-damage study of painted metals at 1.07 μ m,” presentation at the *Directed Energy Systems Symposium*, Directed Energy Professional Society, March 2011, Monterey, California. [CDE]

Hurd, E.J., Holtgrave, J., Perram, G.P., “Characteristics of a High-Intensity, Pulsed, Potassium Vapor Laser,” presentation at the *13th Annual Directed Energy Symposium*, Nov 2010, Bethesda, MD. [CDE]

Pitz, G.A., Fox, C.D., Perram, G.P., “Collisional Energy Transfer between the cesium $6^2P_{1/2,3/2}$ levels by H₂, HD, D₂, CH₄, C₂H₆, CF₄, and C₂F₆,” presentation at the *13th Annual Directed Energy Symposium*, Nov 2010, Bethesda, MD. [CDE]

Rice, C.A., Perram, G.P., “A preliminary study of atmospheric propagation for potassium DPAL HEL systems with atmospheric oxygen using a rugged TDLAS system,” presentation at the *13th Annual Directed Energy Symposium*, Nov 2010, Bethesda, MD. [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

SPONSOR FUNDED RESEARCH PROJECTS

“Support to NNSA for QASPR Independent Review.” Sponsor: NNSA. Funding: \$50,000.

“Support Activities to Homeland Security.” Sponsor: DHS. Funding: \$150,000 – Petrosky 90%, Hengehold 10%.

SPONSOR FUNDED EDUCATIONAL PROJECTS

“DTRA GNE Student Support.” Sponsor: DTRA. Funding: \$120,000.

REFEREED JOURNAL PUBLICATIONS

McHale, S.R., McClory, J.W., Petrosky, J.C., Wub, J., Palai, R., Dowben, P.A., and Ketsman, I., "The effective surface Debye temperature of Yb:GaN," *Materials Letters* 65, No. 10, pp. 1476-1478, 31 May 2011.

Xiao, J., Lozova, N., Losovyj, Y.B., Wooten, D., Ketsman, I., Swinney, M.W., Petrosky, J.C., McClory, J.W., Burak, Y.V., Adamiv, V.T., Brant, A.T., and Dowben, P.A., "Surface Charging at the (100) Surface of Cu doped and undoped $\text{Li}_2\text{B}_4\text{O}_7$," *Applied Surface Science* 257, No. 8, pp. 3399–3403, February 2011.

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Williams, C.S., Burggraf, L.W., Adamson, P.E., and Petrosky, J.C., "Optimization of three-dimensional positron annihilation spectroscopy system (3DPASS) for three-dimensional momentum measurements," *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment* 629, p. 175, Feb 2011.

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Duncan, N. A., McClory, J. W., Petrosky, J. C., and Mall, S., "Changes to Electrical Conductivity in Electron Irradiated Nanocomposites," *Hardened Electronics and Radiation Technology Conference 2011*, Paper No. B.2 (Orlando, FL), 2011.

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- Englert, J.W., McClory, J.W., Petrosky, J.C., and Tauxe, L., “Estimating the Magnetic Field Component of an Electromagnetic Pulse Using Time Dependent Isothermal Remanent Magnetization,” *Hardened Electronics and Radiation Technology Conference 2011*, Paper No. PA.1 (Orlando, FL), 2011.
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- Foster, J.C., McClory, J.W., Petrosky, J.C., and Bielejec, E., “Radiation Effects on the Electrical Properties of Hafnium Oxide Based MOS Capacitors,” *Hardened Electronics and Radiation Technology Conference 2011*, Paper No. PI.3 (Orlando FL), 2011.
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- Richards, M. J., Petrosky, J. C., McClory, J. W., and Li, A., “Nuclear Weapon Yield Determination through Nano Indentation of Thermally Degraded Automobile Paint,” *Hardened Electronics and Radiation Technology Conference 2011*, Paper No. D.3 (Orlando, FL), April 2011.
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OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

- Member of Nuclear Engineering Heads Organization. Function as the government representative to the NE panel.
- Chair, QASPR Independent Review Committee, for NNSA
- Member: American Nuclear Society IEEE and ASEE
- Co-Chair Risk analysis embedded topic for ANS 2012.
- Christina L. Dugan, Robert Hengehold, Stephen McHale, Yaroslav Losovyj, John McClory and James Petrosky, “Photoemission and Cathodoluminescence of Doped Lithium Tetraborate Crystals Being Developed for Neutron Detection,” presented at the Materials Research Society Spring Meeting, 26 Apr 11, San Francisco, CA.
- S.R. McHale, J.W. McClory, J.C. Petrosky, J. Wu, A. Rivera, A. Martinez, R. Palai, P.A. Dowben, Ya.B. Losovyj, “Schottky Barrier Formation Between Au and Rare-Earth Doped GaN Thin Films,” presented at the American Vacuum Society Symposium, 17 Oct 2010, Albuquerque, NM.
- Bickley, A.A., Bevins, J., McClory, J., Dowben, P., Miller, W., and Petrosky, J., “Design and testing of a boron carbide based neutron spectrometer for homeland security applications,” invited presentation at the American Chemical Society Fall 2011 National Meeting, Denver, Colorado, 30 August 2011.

- Bickley, A.A., McClory, J.W., Petrosky, J.C., and Dowben, P.A., "Performance evaluation of neutron detectors incorporating intrinsic Gd using a GEANT4 modeling approach," presented at the 2011 Materials Research Society Spring Conference, San Francisco, California, 25 April 2011.
- Bevins, J., McClory, J., Petrosky, J., and Caruso, A., "Theoretical Performance of a p-Type B_5CH_x Thin Film on n-Si Heterojunction Diode," presented at the 2010 American Nuclear Society Winter Meeting, Las Vegas, NV, 9 Nov 2010.
- McHale, S.R., McClory, J.W., Petrosky, J.C., Wu, J., Rivera, A., Martinez, A., Palai, R., Dowben, P.A., and Losovyj, Y.B., "Photoemission Studies of Au-Gd_xGa_{1-x}N Schottky Barrier Formation," presented at the Fall 2010 Materials Research Society Meeting, Boston, MA, 3 Dec 2010.
- McClory, J.W., Kananen, B.E., Brant, A.T., Petrosky, J.C., and Halliburton, L.E., "Point Defects and Their Role in Thermoluminescence in Silver Doped Lithium Tetraborate ($Li_2B_4O_7$) Crystals Being Developed for Neutron Dosimetry," presented at the Fall 2010 Materials Research Society Meeting, Boston, MA, 1 Dec 2010.
- Karki, S., Bevins, J.E., Sandstrom, J., Clayton, C., Driver, M.S., Nordell, B., McClory, J.W., Petrosky, J.C., Pokhodnya, K.I., and Caruso, A.N., "Fabrication and transport properties of a- $B_5C:H_x$ to n-type Si heterojunction diodes," presented at the American Physical Society March Meeting 2011, Dallas TX, 15 Mar 2011.
- Myers, E.R., McNamara, B.K., Casella, A.M., Dowben, P.A., McClory, J.W., Petrosky, J.C. and Caruso, A.N., "Electrical Carrier Transport and Electronic Structure Studies of Amorphous UO_2 ," presented at the American Physical Society March Meeting 2011, Dallas TX, 15 March 2011
- Jackson, H.C., Dorsey, D., Petrosky, J.C., and McClory, J.W., "Impact of Silicon Nitride Passivation Thickness on Electron Irradiated AlGaIn/GaN," presented at the Materials Research Society Spring Meeting, San Francisco, CA, 26 Apr 2011.
- Jackson, H.C., Farlow, G.C., Cooper, T., Petrosky, J.C., and McClory, J.W., "Mobility Variation in Electron Irradiated Gated and Ungated AlGaIn/GaN High Electron Mobility Transistors," presented at the Materials Research Society Spring Meeting, San Francisco, CA, 28 Apr 2011
- Wooten, D., Ketsman, I., Xiao, J., Losovy, Y.B., Petrosky, J.C., McClory, J.W., Burak, Y.V., Adamiv, V.T., Brown, J.M., Dowben, P.A., "The electronic structure of $Li_2B_4O_7$ (110) and $Li_2B_4O_7$ (100)," presented at the Materials Research Society Fall Meeting, Boston, MA, 2 Dec 2010.
- McClory, J.W., Bevins, J.E., Dahl, K.R., Petrosky, J.C., and Caruso, A.N., "Bulk Radiation Damage Effects of a p-type $B_5C:H_x$ Thin Film on n-Si Heterojunction Diode," presented at the Hardened Electronics and Radiation Technology Conference, Orlando, FL, 1 Apr 2011.
- McClory, J. W., Foster, J.C., Petrosky, J.C., and Bielejec, E., "Radiation Effects on the Electrical Properties of Hafnium Oxide Based MOS Capacitors," presented at the Hardened Electronics and Radiation Technology Conference, Orlando, FL, 30 Mar 2011.
- McClory, J.W., Kananen, B.E., Brant, A.T., and Petrosky, J.C., "Characterization of Neutron Induced Defects in Lithium Tetraborate Using Electron Paramagnetic Resonance and Thermoluminescence," presented at the Hardened Electronics and Radiation Technology Conference, Orlando, FL, 30 Mar 11.
- McClory, J.W., Duncan, N.A., Petrosky, J.C., and Mall, S., "Changes to Electrical Conductivity in Electron Irradiated Nanocomposites," presented at the Hardened Electronics and Radiation Technology Conference, Orlando, FL, 29 Mar 2011.

May, R. E., Jackson, H.C., Petrosky, J.C., and McClory, J.W., “Leakage Currents in Ion Irradiated AlGaIn/GaN High Electron Mobility Transistors,” presented at the Hardened Electronics and Radiation Technology Conference, Orlando, FL, 30 Mar 2011.

Englert, J.W., McClory, J.W., Petrosky, J.C., and Tauxe, L., “Estimating the Magnetic Field Component of an Electromagnetic Pulse Using Time Dependent Isothermal Remanent Magnetization,” presented at the Hardened Electronics and Radiation Technology Conference, Orlando, FL, 30 Mar 2011.

Richards, M. J., Petrosky, J. C., McClory, J. W., and Li, A., “Nuclear Weapon Yield Determination through Nano Indentation of Thermally Degraded Automobile Paint,” presented at the Hardened Electronics and Radiation Technology Conference, Orlando, FL, 31 Mar 2011.

Petrosky, J., Englert, J., and McClory, J., “Nuclear Generated Electromagnetic Pulse,” invited talk at the classified session of the Hardened Electronics and Radiation Technology Conference, Orlando, FL, 31 Mar 2011.

Estep, N.A., Petrosky, J., McClory, J., Kim, Y., and Terzuoli, A., “Electromagnetic Interference (EMI) and Ionizing Radiation Effects on CMOS Devices,” presented at the IEEE Nuclear and Space Radiation Effects Conference, 22 Jul 11.

McHale, S.R., McClory, J.W., Petrosky, J.C., Wu, J., Rivera, A., Martinez, A., Palai, R., Dowben, P.A., and Losovyj, Ya.B., “Schottky Barrier Formation Between Au and Rare-Earth Doped GaN Thin Films,” presented at the American Vacuum Society Symposium, Albuquerque, NM, 17 Oct 2010.

RANDALL, ROBB M., Lt Col,

Assistant Professor of Atmospheric Physics, Department of Engineering Physics, AFIT Appointment Date: 2007 (AFIT/ENP); BS, Meteorology, The University of Oklahoma, 1995; MS, Meteorology, Air Force Institute of Technology, 2002; PhD, Atmospheric Sciences, The University of Arizona, 2007. Maj Randall’s research interests include understanding and characterizing the atmosphere and atmospheric effects of remote sensing retrievals, evaluating uncertainty in high-energy laser engagement due to atmospheric effects, and understanding how climate change affects weapon systems and high altitude sensing platforms. Maj Randall is a member of the American Meteorological Society and American Geophysical Union. (DSN: 271-9544 ; COMM: 402-294-9544), email: Robb.Randall@offutt.af.mil

REFEREED JOURNAL PUBLICATIONS

Fiorino, S.T., Randall, R.M., Bartell, R.J., Downs, A., Chu, P., and Fan, C.W., “Climate Change: Anticipated Effects on High Energy Laser Weapon Systems in Maritime Environments,” *Journal of Applied Meteorology and Climatology* 50, No. 1, pp. 153-166, Jan 2011. [CDE]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Randall, R.M., S.T. Fiorino, M.F. Via, and A.D. Downs, “Validation of Technique to Hyperspectrally Characterize the Lower Atmosphere with Limited Surface Observations,” *Proceedings SPIE*, Vol. 8038, Article No. 803807 (2011). [CDE]

RIES, HEIDI R.,

Associate Professor of Physics, Department of Engineering Physics, AFIT Appointment Date: 1999 (AFIT/ENP) and Dean for Research, Graduate School of Engineering and Management (AFIT/ENR); BS, Physics, The Ohio State University, 1982; MS, Physics, The Ohio State University, 1984; PhD, Applied Physics, Old Dominion University, 1987. Dr. Ries’ research interests include radiation effects, nonlinear optical materials, electron paramagnetic resonance spectroscopy, and laser processing of materials. Before joining the AFIT faculty, Dr. Ries served as Director of the Center for Materials Research at Norfolk State University in Norfolk, Virginia, and Associate Director of the Applied Research Center at the Jefferson Center for Research and Technology Research Park in Newport News, Virginia. She was elected to the ASEE Engineering Research Council Board of Directors in 2008 and has served on the Engineering and

Science Foundation of Dayton Board since 2005. Tel. 937-255-3636 x4544 (DSN 785-3636 x4544), email: Heidi.Ries@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

“Launching Equity in the Academy across the Dayton Entrepreneurial Region (LEADER).” Sponsor: NSF. Funding: \$34,279.

“AFOSR Research Support.” Sponsor: AFOSR. Funding: \$18,520.

“AFOSR Speaker Fund.” Sponsor: AFOSR. Funding: \$20,000.

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. Tel. 937-255-3636 x4569 (DSN 785-3636 x4569), email: Eugene.Sheely@afit.edu

REFEREED CONFERENCE PAPER BASED ON FULL PAPER REVIEW

Sheely, Eugene V., Burggraf, Larry W., Adamson, Paul E., Duan Xiofeng F., and Schmidt, Mike W., “Application of GAMESS/NEO to quantum calculations of muonic molecules,” *Journal of Physics: Conference Series*, Vol 225, Article No. 12049 (2010).

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Presented a seminar, “Fukushima daiichi reactor incident 2011,” at the 4th CBRNE Research and Education Collaboration Symposium, held 21-23 September 2011, at the Calamityville National Center for Medical Readiness in Fairborn, OH.

TUTTLE, RONALD F.,

Associate Professor of Nuclear Engineering and Director, Center for Technical Intelligence Studies and Research (CTISR), Department of Engineering Physics, AFIT Appointment Date: 2001 (AFIT/ENP); BS, Chemical Engineering, University of Missouri (Columbia), 1968; MS, Nuclear Engineering, University of Missouri (Columbia), 1970; PhD, Nuclear Engineering, University of Missouri (Columbia), 1980. Dr. Tuttle’s research areas include applications of active and passive remote sensing, spectroscopy, diagnostics, and signals processing to problems in intelligence collection and exploitation. Other areas of interest include nuclear weapon effects and space nuclear power systems modeling and mechanics of aerosols. He has published in both unclassified and classified refereed archival journals and conference proceedings. Tel. 937-255-3636 x4536 (DSN 785-3636 x4536), email: Ronald.Tuttle@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

“Chief Technology Officer (CTISR).” Sponsor: AFRL/RY. Funding: \$28,000. [CTISR]

“RV Phenomenologies Support: Phase II.” Sponsor: NASIC. Funding: \$82,899 – Tuttle 10%, Bunker 70%, Garvin 20%. [CTISR]

“ARL Technical Assistance Program (ATAP).” Sponsor: ARL. Funding: \$15,000 – Tuttle 15%, Borel-Donohue 85%. [CTISR]

SPONSOR FUNDED EDUCATIONAL PROJECTS

“CEH Course.” Sponsor: NASIC. Funding: \$56,419 – Tuttle 50%, Bunker 50%. [CTISR]

“Project Pegasus.” Sponsor: AFIAA. Funding: \$232,585 – Tuttle 50%, Bunker 50%. [CTISR]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Christoph C. Borel and Ronald F. Tuttle, “Simulation of sub-pixel thermal target detection,” IEEE Aerospace Conference, Big Sky March 5-12, (2011). [CTISR]

Christoph C. Borel and Ronald F. Tuttle, “Recent advances in temperature emissivity separation algorithms,” IEEE Aerospace Conference, Big Sky March 5-12, (2011). [CTISR]

Christoph C. Borel and Ronald F. Tuttle, “Multi- and hyperspectral scene modeling,” Proc. SPIE 7812, 78120K, (2011). [CTISR]

Borel, C., Bunker, D., Walford, G., Magnus, A., Miller, L., and Tuttle, R., “Rapid Location Of Radiation Sources In Complex Environments Using Optical And Radiation Sensors,” 4th CBRNE Research & Education Collaboration Symposium, Fairborn, Ohio, 21-23 Sep 2011. [CTISR]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Ronald F. Tuttle and Donald Hemminger, “Seeds of Learning,” AETC Symposium, San Antonio, TX, 20-21 Jan 2011.

Recognized by MajGen Walter D. Givhan during Winter 2011 Commandant Call for the Channel 2 coverage of the INSPIRE Project to identify suicide bombers.

Member of the Faculty Council’s Committee on Quarter to Semester Impact to AFIT Chair committee to Name Bldg 644 of AFIT campus.

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.

SPONSOR FUNDED RESEARCH PROJECTS

“OPIR Algorithm Assessment.” Sponsor: AFSPC. Funding: \$65,000 – Walli 60%, Bunker 40%. [CTISR]

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

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Blank, L.A., Weeks, D.E., and Kedziora, G.S., "Potential Energy Surfaces of M+Ng, M = K, Rb, Cs, and Ng = He, Ne, Ar," presented at the 66th International Symposium on Molecular Spectroscopy, Columbus, OH, 20-24 June 2011. [CDE]

Weeks, D.E., Belcher, L.T., Blank, L.A., and Kedziora, G.S., "Potential Energy Surfaces and Derivative Coupling Terms for M+Ng, M = K, Rb, Cs, and Ng = He, Ne, Ar," presented at the Spring 2011 Meeting of the Ohio-Region Section of the APS, University Heights, OH, 15-16 April 2011. [CDE]

Weeks, D.E. and Barger, L.A., "Scattering Matrix Elements for the Non-Adiabatic B+H₂ Collision," presented at the Fall 2010 Meeting of the Ohio-Region Section of the APS, Marietta, OH, 8-9 October 2010. [CDE]

WILLIAMS, CHRISTOPHER, Lt Col,

Assistant Professor of Engineering Physics, Department of Engineering Physics, AFIT Appointment Date: 2010 (AFIT/ENP); BS, University of Connecticut at Storrs, 1994; MS, University of Alabama at Tuscaloosa, 1999; MS, Air Force Institute of Technology; PhD, Air Force Institute of Technology, 2010. Lt Col Williams' research focuses on spectroscopy methods, both gamma and positron annihilation. Before joining AFIT, he was the Lead Project Officer for the W80 and W84 Nuclear Warhead Project Officer's Group where he led an 80-plus person joint Department of Defense and Energy Team to meet Presidential and warfighter requirements and directed and managed a \$2.5 billion W80 Warhead Life Extension. His current work includes studies of ion-implanted SiC using a simultaneous measurement technique incorporating two conventional positron annihilation spectroscopy techniques. He is a member of the American Nuclear Society and Tau Beta Pi. Tel. 505-844-4030 email: cswilli@sandia.gov

REFEREED JOURNAL PUBLICATIONS

Williams, C.S., Burggraf, L.W., Adamson, P.E., and Petrosky, J.C., "Optimization of three-dimensional positron annihilation spectroscopy system (3DPASS) for three-dimensional momentum measurements," *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment* 629, p. 175, Feb 2011.

REFEREED CONFERENCE PAPERS BASED ON FULL PAPER REVIEW

Williams, C., Burggraf, L., Adamson, P., Petrosky J., "Three-dimensional Electron-Positron Momentum Distribution Of O³⁺-Irradiated 6H SiC Using Two Positron Spectroscopy Techniques Simultaneously," *Journal of Physics: Conference Series*, Vol. 262, Article No. 012064, pp. 1-5, 2011.

Williams, C., Duan, X., Petrosky, J., Burggraf, L., "Oxygen-atom Defects in 6H Silicon Carbide Implanted Using 24 MeV O³⁺ Ions Measured Using Three-dimensional Positron Annihilation Spectroscopy System (3DPASS)," *AIP Conference Proceedings*, Vol. 1336, pp. 458-464, May 2011.

WOLF, PAUL J.,

Professor of Physics, Department of Engineering Physics, AFIT Appointment Date: 1994 (AFIT/ENP), and Associate Dean for Academic Affairs, Graduate School of Engineering and Management (AFIT/EN); BS, Regis College, 1978; MS, Air Force Institute of Technology, 1979; PhD, Air Force Institute of Technology,

1985. Dr. Wolf's research interests include experimental atomic/molecular spectroscopy, reactive and non-reactive collision kinetics, laser-based thin film deposition processes, ionospheric and atmospheric chemistry, environmental monitoring, and non-linear dynamics with a focus on complex systems. He has published over 20 papers. Tel. 937-255- 0452 (DSN 785-0452), email: Paul.Wolf@afit.edu

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Ohio-Section of the American Physical Society, Executive Committee – Council Representative.

Higher Learning Commission, Consultant-Evaluator.

Midwest Association of Graduate Schools - Chair, Publications Committee.

YEO, YUNG KEE,

Professor of Physics, Department of Engineering Physics, AFIT Appointment Date: 1984 (AFIT/ENP); BS, Seoul National University, 1961; PhD, University of Southern California, 1972. Professor Yeo's research interests are in the area of solid state physics, especially characterization of the electrical, magnetic, and optical properties of elemental, compound, ternary, and quaternary semiconductors using techniques, such as Hall-effect measurement; deep level transient spectroscopy; superconducting quantum interference device; magnetic circular dichroism; cathodoluminescence; electroluminescence; and photoluminescence. Professor Yeo has published more than 100 articles in archival journals and several technical reports, presented more than 200 papers at professional conferences, and holds one patent. He is a reviewer for the Applied Physics Letters, Journal of Applied Physics, Journal of Electronic Materials, and Air Force Office of Scientific Research (AFOSR) proposal. He is currently funded by the AFOSR to study narrow to wide band gap semiconductors, such as GeSn and SiGeSn, InGaAs and InAsP, and ZnO. This work involves collaborative effort with the University of Arizona State, University of Delaware, Air Force Research Laboratory, University of Rensselaer Polytechnic Institute, and Rutgers University. He has directed the research of 7 post-doctoral fellows, 16 PhD students, and 24 MS students. He received the Ezra Kotcher Award for 1990, received the Gage H. Crocker Outstanding Professor Award for 1992, and received the General Bernard A. Schriever Award for 1997. Tel. 937-255-3636 x4532 (DSN 785-3636 x4532), email: Yung.Yeo@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

"Investigation of Optical and Electrical Properties of Bulk InGaAs & InAsP for Optoelectronic Device Applications." Sponsor: AFOSR. Funding: \$232,000.

REFEREED JOURNAL PUBLICATIONS

Roucka, R., Beeler, R., Mathews, J., Ryu, M.W., Yeo, Y.K., Menendez, J., and Kouvetakis, J., "Complementary metal-oxide semiconductor-compatible detector materials with enhanced 1550 nm responsivity via Sn-doping Of Ge/Si(100)," *Journal of Applied Physics* 109, Article No. 103115 (9 pages), May 2011.

Yeo, Y.K., Bergstrom, A.C., Hengehold, R.L., Wei, J.L., Guha, S., Rajagopalan, G., and Ryu, M.Y., "Optical and Electrical Properties of Bulk-Grown Ternary $\text{In}_x\text{Ga}_{1-x}\text{As}$," *Journal of the Korean Physical Society* 58, pp. 1267-1273, May 2011.

Wei, J., Barnes, J., Guha, S., Gonzalez, L.P., Yeo, Y.K., Hengehold, R.L., and Rajagopalan, G., "Electrical and Optical Characterization of Melt Grown Bulk $\text{InAs}_{1-y}\text{P}_y$ Crystals," *Journal of Electronic Materials* 40, pp. 103-108, Feb 2011.

Moore, E.A., Yeo, Y.K., Ryu, Mee-Yi, and Hengehold, R.L., "Electrical Activation Studies of Si-Implanted $\text{Al}_x\text{Ga}_{1-x}\text{N}$ with Aluminum Mole Fraction of 11% to 51%," *Journal of Electronic Materials* 40, pp. 11-16, Jan 2011.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Ahoujja, M., Elhamri, S., Kouvetakis, J., Tolle, J., Ryu, Mee-Yi, and Yeo, Y.K., "Electrical characterization of GeSn grown on Si using ultra high vacuum chemical vapor deposition method," presentation at the March 2011 Meeting of the American Physical Society held on 21-25 March 2011 in Dallas, Texas.

Yeo, Y.K., "Electrical and Optical Characterization of $\text{Ge}_{1-y}\text{Sn}_y$ and $\text{Ge}_{1-x-y}\text{Si}_x\text{Sn}_y$ Direct Bandgap Semiconductors," presented at the Air Force Office of Scientific Research 2011 Joint Electronics Program Review held on 23-26 May 2011 in Washington, D.C.

Yeo, Y.K., "Electrical and Optical Characterization of Bulk Grown Ternary $\text{In}_x\text{Ga}_{1-x}\text{As}$ and $\text{InAs}_{1-y}\text{P}_y$," presented at the Air Force Office of Scientific Research 2011 Joint Electronics Program Review held on 23-26 May 2011 in Washington, D.C.

5.4. DEPARTMENT OF MATHEMATICS AND STATISTICS

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5.4.1. DOCTORAL DISSERTATIONS

CALLIHAN, ROBERT S., *Analysis of Transient Electromagnetic Scattering from an Overfilled Cavity Embedded in an Impedance Ground Plane*. AFIT/DAM/ENC/11-01. Faculty Advisor: Dr. Aihua W. Wood. Sponsor: AFRL/RV.

GOLDBERG, JACOB B., *An Analytical Model of Nanometer Scale Viscoelastic Properties of Polymer Surfaces Measured Using an Atomic Force Microscope*. AFIT/DAM/ENC/11-03. Faculty Advisor: Dr. William P. Baker. Sponsor: AFNWC.

5.4.2. MASTER'S THESES

HURST, ALEXIS X., *Modeling of Bacillus Spores: Inactivation and Outgrowth*. AFIT/GAM/ENC/11-01. Faculty Advisor: Dr. William P. Baker. Sponsor: AFNWC & DTRA.

ROSADO, WILLIAM R., *Comparison of Development Test and Evaluation and Overall Program Estimate at Completion*. AFIT/GCA/ENC/11-02. Faculty Advisor: Dr. Edward D. White. Sponsor: OSD.

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 and asymptotics for bichromatic and solitary waves. Tel. 937-255-3636 x4522 (DSN 785-3636 x4522), email: Benjamin.Akers@afit.edu

BAKER, WILLIAM P.,

Associate Professor of Mathematics, Department of Mathematics and Statistics, AFIT Appointment Date: 1994 (AFIT/ENC); BA, University of California at Irvine, 1969; MA, University of California at Irvine, 1970; PhD, Northwestern University, 1987. Dr. Baker's research interests include asymptotic and perturbation methods, wave propagation and scattering theory, applied mathematics, functional analysis, low observables, and numerical analysis. Dr. Baker's current research is in thermal dynamics of high speed wear, vibrational dynamics of thermally loaded materials and dynamics and control of satellite structures. Dr. Baker is a Master Navigator with prior military assignments in flight test, satellite communications, cruise missile and radar analysis. Tel. 937-255-3636 x4517 (DSN 785-3636 x4517), email: William.Baker@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

“Pulse Forensics Enhanced Real-time De-interleaving (HORSE).” Sponsor: AFRL/RV. Funding: \$30,000 – Baker 51%, Oxley 49%. [COA]

REFEREED JOURNAL PUBLICATIONS

Shepherd, M. J., R. G. Cobb, A. N. Palazotto, and W. P. Baker, Scaling analyses for large-scale space-based membrane optics, *AIAA Journal* **49**, No. 7, (2011), 1313-1323.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Easterday, O., A. Palazotto, R. Branam, and W. Baker “Characterization of Bulk Mechanical Complex Modulus of a Thermal Barrier Coating,” 6th Annual Dayton Engineering Sciences Symposium, ASME, Wright State University, Dayton, OH, October 2010.

Easterday, O., A. Palazotto, R. Branam, and W. Baker “Experimental Characterization of Damping Properties of Coatings at Elevated Temperatures,” 52nd AIAA SDM Conference, Denver, CO, April, 2011.

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

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: \$44,474.

REFEREED JOURNAL PUBLICATIONS

Bulutoglu, D. A. and Kaziska D. M., Erratum to “Improved WLP and GWP lower bounds based on exact integer programming” [*Journal of Statistical Planning and Inference* **140** (2010), 1154–1161], *Journal of Statistical Planning and Inference* **141** (2011), 2500-2501.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Reviewer: *Operations Research*.

Bulutoglu, D. A. “Determining the Existence Status of an OA with a Given Set of Parameters,” International Conference on Design of Experiments (ICODOE-2011), University of Memphis, Memphis, TN, May, 2011.

Bulutoglu, D. A. “Determining the Existence Status of an OA with a Given Set of Parameters,” Spring Research_Conference on Statistics in Industry and Technology, Northwestern University, Evanston, IL, June, 2011.

Bulutoglu, D. A. “Determining the Existence Status of an OA with a Given Set of Parameters,” Informs Midwestern.

Conference, The Ohio State University, Columbus, OH, August 2011.

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. Tel. 937-255-3636 x4516, email: Shay.Capehart@afit.edu

CHAPIN, PATRICK S., Capt,

Assistant Professor of Statistics, Department of Mathematics and Statistics, AFIT Appointment Date: 2009, (AFIT/ENC); BS, United States Air Force Academy, 2002; MS, Air Force Institute of Technology, 2004; PhD, Iowa State University, 2009. Capt Chapin’s research interests include computer experiments, validation of computer models, design of experiments, MCMC simulation and Bayesian Statistics. He has served as an Air Force analytical scientist for 3 years including manpower/force structure analysis and BRAC cost analysis. Tel. 937-255-3636 x3320 (DSN 785-3636 x3320), email: Patrick.Chapin@afit.edu

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

BOOKS AND CHAPTERS IN BOOKS

Cordeiro, J. D. and J. P. Kharoufeh, "Batch Markovian Arrival Processes," *Wiley Encyclopedia of Operations Research and Management Science*, 1st Ed., J. Cochran, L.A. Cox, P. Keskinocak, J.P. Kharoufeh, J.C. Smith, eds., John Wiley & Sons, New York, NY, pp. 367-374.

DEA, JOHN R., Lt Col,

Assistant Professor of Mathematics, Department of Mathematics and Statistics, AFIT Appointment Date: 2008 (AFIT/ENC); BS, Baylor University, 1993; MS, Creighton University, 1998; PhD, Naval Postgraduate School, 2008. LtCol Dea's research interests include numerical analysis of fluid flow and wave propagation, including recent papers on non-reflecting boundary conditions for modeling wave propagation in a truncated portion of a large or infinite domain. LtCol Dea's previous military assignments include software development for strategic war-planning systems, flight test support and coordination, and architecture and systems engineering for long-term space superiority mission area planning. Tel. 937-255-3636 x4584, email: John.Dea@afit.edu

REFEREED JOURNAL PUBLICATIONS

Dea, J., Improving the performance of Higdon non-reflecting boundary conditions by using weighted differencing, *Applied Numerical Mathematics* **61** (2011), 1186-1197.

Dea, J., An experimental adaptation of Higdon-type non-reflecting boundary conditions to linear first-order systems, *Journal of Computational and Applied Mathematics* **235** (2011), 1354-1366.

DILLARD, KAREN E. M., Lt Col,

Assistant Professor of Mathematics, Department of Mathematics and Statistics, AFIT Appointment Date: 2007, (AFIT/ENC); BS, Rensselaer Polytechnic Institute, 1994; MS, University of Massachusetts - Lowell, 1997; PhD, North Carolina State University, 2007. Lt Col Dillard's research interests include numerical analysis and optimization. She was previously assigned as a personnel officer, instructor at USAFA, and scientific analyst involved with analysis of alternatives.

ERICH, ROGER A., Capt,

Instructor of Statistics, Department of Mathematics and Statistics, AFIT Appointment Date: 2011, (AFIT/ENC); BS, The Pennsylvania State University, 2003; M.S., Air Force Institute of Technology, 2005; M.S., The Ohio State University, 2009; PhD Candidate, The Ohio State University, 2011. Capt Erich's research interests include biostatistics and survival analysis. He has served as an Air Force analytical scientist for 3 years as a wargaming operations analyst. Tel. 937-255-3636 x7124 (DSN 785-3636 x7124), email: 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

SPONSOR FUNDED RESEARCH PROJECTS

"Fusion Frames for Distributed Processing and Communication." Sponsor: AFOSR. Funding: \$26,119.

"Functional Analysis for Passive Navigation and Surveillance." Sponsor: AFOSR. Funding: \$70,000.

"Theory of Multiresolution Classification Bases and Frames." Sponsor: NSF. Funding: \$17,546.

"ATD: Frame-Theoretic Information Fusion for Threat Detection." Sponsor: NSF. Funding: \$61,065.

REFEREED JOURNAL PUBLICATIONS

- Massar, M. L., M. Fickus, E. Bryan, D. T. Petkie, and A.J. Terzuoli, Fast computation of spectral centroids, *Advances in Computational Mathematics* **35** (2011), 83-97.
- Casazza, P. G., M. Fickus, D. G. Mixon, J. C. Tremain, The Bourgain-Tzafriri conjecture and concrete constructions of non-pavable projections, *Operators and Matrices* **5** (2011), 351-363.
- Chebira, A., M. Fickus, and D. G. Mixon, Filter bank fusion frames, *IEEE Transactions on Signal Processing* **59** (2011), 953-963.
- Casazza, P. G., M. Fickus, D. G. Mixon, Y. Wang, and Z. Zhou, Constructing tight fusion frames, *Applied Computational Harmonic Analysis* **30** (2011), 175-187.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

- Mixon, D. G., C. Quinn, N. Kiyavash, and M. Fickus, Equiangular tight frame fingerprinting codes, *Proceedings of the IEEE International Conference on Acoustics, Speech, and Signal Processing* (2011), 1856-1859.
- Fickus, M., D. G. Mixon, and J. C. Tremain, Constructing a large family of equiangular tight frames, *Proceedings of the Conference on Sampling Theory and Applications* (2011), 4 pages.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

- Proposal Reviewer for National Science Foundation and Air Force Office of Scientific Research.
- Reviewer: *Applied Computational Harmonic Analysis*, *IEEE Transactions on Information Theory*, *Journal of Fourier Analysis and Applications*. and *Proceedings of the American Mathematical Society*.
- Reviewer for the proceedings of 9th *International Conference on Sampling Theory and Applications*.
- Fickus, M. C., "Robust information fusion via frame completion," AFOSR Program Review on "Information Fusion and Distributed Intelligence," Arlington, VA, December, 2010.
- Fickus, M. C., "Frames, Riesz bases and the Restricted Isometry Property," AFOSR Program Review on "Mathematical Modeling of Cognition and Decision," Dayton, OH, January, 2011.
- Fickus, M. C., "Robust information fusion via frame completion," DTRA/NSF DMS Program Review on "Algorithms for Threat Detection," Boston, MA, June, 2011.
- Fickus, M. C., "Constructing equiangular tight frames," AFOSR Program Review on "Sensing, Surveillance and Navigation," Shalimar, FL, June, 2011.
- Fickus, M. C., "Frame completions for optimally robust reconstruction," SPIE Optics & Photonics, Wavelets and Sparsity XIV, San Diego, CA, August, 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

REFEREED JOURNAL PUBLICATIONS

Lair, A. V., Nonradial entire large solutions of semilinear elliptic equations, *Journal of Partial Differential Equations* **23**, No. 4 (2010), 366-373.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Editorial Board, *ISRN Mathematical Analysis*.

Reviewer: *Mathematical Reviews*.

Lair, A. V., "Large solutions of semilinear elliptic systems," Department of Mathematical Sciences Colloquium, Ball State University, Muncie, IN, September, 2011.

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

NOVAK, KYLE A., Lt Col,

Assistant Professor of Mathematics, Department of Mathematics and Statistics, AFIT Appointment Date: 2006. (AFIT/ENC); BS, University of Wisconsin-Madison, 1993; MA, University of Wisconsin-Madison, 1995; PhD, University of Wisconsin-Madison, 2006. Lt Col Novak's research interests include numerical methods for high frequency limits of quantum phenomena. Lt Col Novak's previous military assignments have been in research and development, signals intelligence, and operational testing.

OXLEY, MARK E.,

Professor of Mathematics, Department of Mathematics and Statistics, AFIT Appointment Date: 1987 (AFIT/ENC), and Researcher, Sensor Fusion Laboratory, Center for Operational Analysis (COA); BS, Cumberland College, 1978 (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

SPONSOR FUNDED RESEARCH PROJECTS

"Fusion of Disparate Sensor Exploitation Systems." Sponsor: AFOSR. Funding: \$46,367. [COA]

"Sensor-Exploitation Fusion for Integrated Structural Health Monitoring." Sponsor: AFRL/RB. Funding: \$45,000. [COA]

REFEREED JOURNAL PUBLICATIONS

Schubert, C. M., S. N. Thorsen, and M. E. Oxley, The ROC manifold for classification systems, *Pattern Recognition* **44**, No. 2 (2011), 350-362.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Sallberg, S. A., P. S. Maybeck, and M. E. Oxley, "Infinite-dimensional sampled-data Kalman filtering and the stochastic heat equation," *Proceedings of the 49th IEEE Conference on Decision and Control* (2010), 5062-5067.

Sallberg, S. A., P. S. Maybeck, and M. E. Oxley, "Infinite-dimensional sampled-data Kalman filtering," *Proceedings of the 49th IEEE Conference on Decision and Control* (2010), 7363-7368.

Reynolds, M. B., K. M. Hopkinson, M. E. Oxley, and B. E. Mullins, "Provisioning norm: An asymmetric quality measure for SaaS resource allocation," *Proceedings of the 8th International Conference on Services Computing* (2011), paper 3015.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Oxley, M. E., K. E. Daly, C. M. Schubert Kabban, and D. A. Zitelli, "Sequential fusion," *Proceedings of SPIE, Signal Processing, Sensor Fusion, and Target Recognition XX*, **8050** (2011), paper 30.

Sturtz, K., J. Culbertson, M. E. Oxley, and S. K. Rogers, "Categorification of the layered sensing construct," *Proceedings of SPIE, Evolutionary and Bio-Inspired Computation: Theory and Applications V*, **8059** (2011), paper 10.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Oxley, M., C. Schubert Kabban, and M. Derriso, "Fusion of disparate sensor-exploitation systems," Integrated Systems Health Management (ISHM) Conference 2011. Boston, MA, July, 2011.

Associate Editor, *Journal of Information Fusion*.

Referee: *Advances in Information Fusion*, *Information Fusion*, and *Natural Resource Modeling*.

Reviewer for Pacific Northwest National Laboratory (PNNL), Signature Discovery Initiative.

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

QUINN, DENNIS W.,

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

the skin in pharmacokinetic modeling, and using the boundary element method for moving boundary problems. Tel. 937-255-3636 x4522 (DSN 785-3636 x4522), email: Dennis.Quinn@afit.edu

REYNOLDS, DANIEL E.,

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

SCHUBERT KABBAN, CHRISTINE M.,

Assistant Professor of Statistics, Department of Mathematics and Statistics, AFIT Appointment Date: 2010 (AFIT/ENC); BA, University of Dayton, 1992; MBA, Wright State University, 1994; MS, Wright State University, 1995; PhD, Air Force Institute of Technology, 2005. Dr. Schubert's research interests include classification techniques, ROC curve theory and extensions, information fusion, longitudinal modeling, regression and regression extensions, survey design and analysis, and general biostatistics. Dr Schubert's current research is in evaluating the performance of classification systems and 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

SPONSOR FUNDED RESEARCH PROJECTS

"Performance Evaluation in Structural Health Monitoring Systems." Sponsor: AFRL/RB. Funding: \$45,235.

REFEREED JOURNAL PUBLICATIONS

Brown, J.F. and C. M. Schubert, An examination of emergency department pediatric psychiatric services: A pilot study, *Journal of Behavioral Health Services and Research* **37**, No. 4 (2010), 412-426. PMID19731041.

Schubert, C.M., S. N. Thorsen, and M. E. Oxley, The ROC manifold for classification systems, *Pattern Recognition* **44**, No. 2 (2011), 350-362.

Lyon, D.E., J. Walter, C. L. Munro, C. M. Schubert, and N. L. McCain, Challenges in interpreting cytokine biomarkers in biobehavioral research: A breast cancer exemplar, *Biological Research for Nursing* **13**, No. 1 (2011), 25-31. PMID: 21199813.

Bajaj, J.S., K. Saeian, C. M. Schubert, R. Franco, J. Franco, and D. M. Heuman, Disruption of sleep architecture in hepatic encephalopathy and ghrelin secretion. *Alimentary Pharmacology & Therapeutics* **34** (2011), 103-105. PMID: 21631553

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Oxley, M. E., K. E. Daly, C. M. Schubert Kabban, and D. A. Zitelli, "Sequential fusion," *Proceedings of SPIE, Signal Processing, Sensor Fusion, and Target Recognition XX*, **8050** (2011), paper 30.

Schubert, C.M. and M. M. Derriso, "Certification in Structural Health Monitoring Systems," *Proceedings of the 8th International Workshop on Structural Health Monitoring* **2** (2011), 2429-2436.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Member, Research Committee, Center for Human Animal Interaction, Virginia Commonwealth University.

Grant reviewer for Center for Human Animal Interaction, Virginia Commonwealth University.

Schubert, C.M., "The ROC Manifold for Classification Performance." Department of Mathematics and Statistics Colloquium. Wright State University, Dayton, OH, April, 2011.

Schubert, C.M., "A statistical framework for verification and validation of Structural Health Monitoring Systems," Integrated Systems Health Management (ISHM) Conference 2011. Boston, MA, July, 2011.

Oxley, M., C. Schubert Kabban, and M. Derriso, "Fusion of disparate sensor-exploitation systems," Integrated Systems Health Management (ISHM) Conference 2011. Boston, MA, July, 2011.

WARR, RICHARD L., Maj,

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. Maj Warr's research interests include reliability, semi-Markov processes, Bayesian statistics and model fit assessment. Tel. 937-255-3636 x4669 (DSN 785-3636 x4669), email: Richard.Warr@afit.edu

REFEREED JOURNAL PUBLICATIONS

Warr, R. L. and A. V. Huzurbazar, Expanding the statistical flowgraph model framework to use any transition distribution, *Journal of Statistical Theory and Practice* **4**, No. 4 (2010), 529-539.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Picard, R. R., B. J. Williams, L. P. Swiler, A. Urbina and R. L. Warr, "Multiple model inference with applications to uncertainty quantification for complex codes." Los Alamos National Lab Technical Report LA-UR-10-06382 (2010).

Warr, R. L., "Numerical Solutions of Statistical Flowgraph Models," Joint Statistical Meeting, Miami, FL, August, 2011.

Warr, R. L., "A Bayesian Semi-Markov-Accelerated Failure Time Model with Time-Dependent Covariates," Department of Bioinformatics and Biostatistics Seminar, University of Louisville, Louisville, KY, October, 2010.

Reviewer: *Technometrics*, *Journal of Statistics Education*, and *Naval Research Logistics*.

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

SPONSOR FUNDED RESEARCH PROJECTS

"Earned Value Detection Modeling." Sponsor: OSD. Funding: \$30,000 – White 60%, Pignatiello 20%, Unger 20%.

REFEREED JOURNAL PUBLICATIONS

Tracy, Steven P. and E. D. White, Estimating the final cost of a DOD acquisition contract, *Journal of Public Procurement* **11**, No. 2 (2011), 2-18.

Poulos, Elizabeth T. and E. D. White, Using growth models to improve accuracy of estimates at completion for over target baseline contracts, *Journal of Cost Analysis and Parametrics*, Fall (2010), 37-43.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Co-Editor, *Journal of Cost Analysis and Parametrics*.

Referee, *Journal of Cost Analysis and Parametrics* and *Military Operations Research*.

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

SPONSOR FUNDED RESEARCH PROJECTS

“Distributional Direct Simulation Monte Carlo Methods.” Sponsor: AFOSR. Funding: \$31,583.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Wood, A. W., “Topics on electromagnetic scattering from cavities.” University of Dayton Mathematics Colloquium, November, 2010.

Wood, A. W., “A Distributional Monte Carlo Method for Rarefied Gas Dynamics.” Applied Mathematics Colloquium, Wright State University, March, 2011.

Wood, A. W., “A Distributional Monte Carlo Method for Rarefied Gas Dynamics.” AFOSR Computational Mathematics Program Review, Arlington, VA, June, 2011.

Wood, A. W., “A DMC Method for Rarefied Gas Dynamics,” International Conference on Interdisciplinary Applied and Computational Mathematics, Hangzhou, China, June, 2011.

Chaired “Wave SPDE” session at International Conference on Interdisciplinary Applied and Computational Mathematics, Hangzhou, China, June, 2011.

5.5. DEPARTMENT OF OPERATIONAL SCIENCES

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5.5.1. DOCTORAL DISSERTATIONS

BEDNAR, EARL M., *Identification and Classification of Player Types in Massive Multiplayer Online Games Using Avatar Behavior*. AFIT/DS/ENS/11S-01. Faculty Advisor: Dr. John O. Miller. Sponsor: HQ USAF/A9. [COA]

RYER, DAVID M., *Quest Hierarchy for Hyperspectral Face Recognition*. AFIT/DS/ENS/10-03. Faculty Advisor: Dr. Kenneth W. Bauer. Sponsor: AFRL/RV. [COA]

5.5.2. MASTER'S THESES

ALZBEN, MOHAMMED I., *The Impact of Environmental Factors on Internal Integration in Support of Supply Chain Management*. AFIT/LSCM/ENS/11-01. Faculty Advisor: Lt Col Doral E. Sandlin. Sponsor: Saudi Arabia's Ministry of Defense and Aviation. [COA]

BERNARDONI, BRANDON J., *Utilizing Social Network Analysis in Support of Nation Building*. AFIT/OR/MS/ENS/11-01. Faculty Advisor: Dr. Richard F. Deckro. Sponsor: USSOCOM.

BUCHHEIT, ERIC W., *Optimizing Ground Times for AMC Aircraft in Afghanistan*. AFIT/OR/MS/ENS/11-02. Faculty Advisor: Dr. James T. Moore. Sponsor: AMC/A9. [COA]

CAMMARANO, VINCENT R., *Estimating Cargo Airdrop Collateral Damage Risk*. AFIT/LSCM/ENS/11-02. Faculty Advisor: Dr. Jeffery K. Cochran. Sponsor: AMC/A2. [COA]

CHUA, MICHAEL E., *A Simulation of the ECSS Help Desk with the Erlang A Model*. AFIT/GCA/ENS/11-01. Faculty Advisor: Dr. Jeffrey A. Ogden. Sponsor: HQ USAF/A4. [COA]

DAVIS, KRISTI R., *Verification and Validation of Component Cost Assessment Program (CCAP)*. AFIT/OR/MS/ENS/11-03. Faculty Advisor: Lt Col Stephen P. Chambal. Sponsor: AFRL/RZ. [COA]

DEGENHARDT, MARK A., *Metric Development for Continuous Process Improvement*. AFIT/OR/MS/ENS/11-04. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: ACC/A9. [COA]

DICKENS, JOHN M., *Central Command Rest and Recuperation Hub-to-Hub Airlift Network Analysis*. AFIT/LSCM/ENS/11-03. Faculty Advisor: Dr. Pamela S. Donovan. Sponsor: AMC/A9. [COA]

DURKAN, MEHMET, *Multi Objective Decision Analysis for Assignment Problems*. AFIT/OR/MS/ENS/11-05. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: TuAF. [COA]

GAGE, HARMON J.A., *Using Upper Layer Weights to Efficiently Construct and Train Feedforward Neural Networks Executing Backpropagation*. AFIT/OR/MS/ENS/11-06. Faculty Advisor: Dr. Kenneth W. Bauer. Sponsor: NASIC. [COA]

GOMES, KESIA G., *A Comparative Study Between U.S. and Brazilian Acquisition Regulations and Practices*. AFIT/LSCM/ENS/11-04. Faculty Advisor: Dr. Jeffrey A. Ogden. Sponsor: N/A. [COA]

HAASE, CASEY L., *Tailoring the Statistical Experimental Design Process for LVC Experiments*. AFIT/GOR/ENS/11-07. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: ASC. [COA]

HACKLEMAN, ANDREW S., *Nuclear Enterprise Performance Measurement*. AFIT/LSCM/ENS/11-05. Faculty Advisor: Dr. Alan W. Johnson. Sponsor: AFMC/OV. [COA]

HAMILTON, JASON S., *Determining Pilot Manning for Bomber Longevity*. AFIT/OR/MS/ENS/11-08. Faculty Advisor: Dr. James W. Chrissis. Sponsor: 509 OG. [COA]

- HOSKET, JONATHON S., *A Methodology Using Simulation Results for Test and Evaluation*. AFIT/OR/MS/11-09. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: N/A. [COA]
- JONES, DUSTIN P., *Optimal CH-47 and C-130 Workload Balance*. AFIT/OR/MS/ENS/11-10. Faculty Advisor: Dr. James T. Moore. Sponsor: AMC/A9. [COA]
- JOYNER, GARDER J., *Measure of Effectiveness for JSTARS Ground Moving Target Indicator: A Value Focused Thinking Approach*. AFIT/OR/MS/ENS/11-11. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: DIA. [COA]
- JUNG, SUNGTAE, *Improving Way of Logistics Management in Korean Army*. AFIT/LSCM/ENS/11-06. Faculty Advisor: Dr. William A. Cunningham. Sponsor: ROKA. [COA]
- LEGUIZA, FRANCISCO E., *By Product Synergy Analysis*. AFIT/LSCM/ENS/11-08. Faculty Advisor: Lt Col Timothy J. Pettit. Sponsor: HQ AFMC. [COA]
- LICKLIDER, CHRISTY A.R., *A Meta-Analysis of the Antecedents of Voluntary Turnover in Studies Involving Active Duty Military Member Populations*. AFIT/GEM/ENS/11-01. Faculty Advisor: Lt Col Sharon G. Heilmann. Sponsor: N/A. [COA]
- MALYEMEZ, CEM, *Multi Criteria Decision Support Model for the Turkish Air Force Personnel Course/ Education Planning System*. AFIT/OR/MS/ENS-11-12. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: TuAF. [COA]
- MCGUIRE, RYAN M., *Weighted Key Player Problem for Social Network Analysis*. AFIT/OR/MS/ENS/11-13. Faculty Advisor: Dr. Richard F. Deckro. Sponsor: USSOCOM.
- MELIN, MEGAN P., *Modeling and Analysis of High Energy Laser Weapon System Performance in Varying Atmospheric Conditions*. AFIT/OR/MS/ENS/11-27. Faculty Advisor: Dr. John O. Miller. Sponsor: AFRL/RD. [COA & CDE]
- MERRITT, KASSANDRA M., *Coverage of Continuous Regions in Euclidean Space using Homogeneous Resources with Application to the Allocation of the Phased Array Radar Systems*. AFIT/GA/ENC/11-01. Faculty Advisor: Lt Col Karen E. Dillard. Sponsor: USNORTHCOM. [COA]
- MESSER, ADAM J., *Contextual Detection of Anomalies in Hyperspectral Images*. AFIT/OR/MS/ENS/11-15. Faculty Advisor: Dr. Kenneth W. Bauer. Sponsor: NASIC. [COA]
- MOHD-ZAID, MOHD FARUL, *Face Recognition via Ensemble Sift Matching of Uncorrelated Hyperspectral Bands and Spectral PCTS*. AFIT/OR/MS/ENS/11-16. Faculty Advisor: Dr. Kenneth W. Bauer. Sponsor: AFRL/RD. [COA]
- PRUITT, JAMES L., *Decision Analysis and Validation of Value Focused Thinking Decision Models Using Multivariate Analysis Techniques*. AFIT/OR/MS/ENS/11-17. Faculty Advisor: Dr. Kenneth W. Bauer. Sponsor: AFMC/A9. [COA]
- QUASHNE, MICHAEL R., *Application of Post Modern Portfolio Theory to Mitigate Risk in International Shipping*. AFIT/OR/MS/ENS-11-18. Faculty Advisor: Dr. James T. Moore. Sponsor: AMC/A9. [COA]
- SCHMIDT, AMY L., *Alternative Active Duty Military Retirement Plan*. AFIT/GCA/ENS/11-02. Faculty Advisor: Dr. William A. Cunningham. Sponsor: HQ AFPC. [COA]
- SPRINGSTON, JAMES J., *Determining the Value of Future Information*. AFIT/OR/MS/ENS/11-20. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: DIA. [COA]

STACK, DONALD A., *Impact of Coalition Requirements on Transportation*. AFIT/OR/MS/ENS/11-21. Faculty Advisor: Dr. James T. Moore. Sponsor: USTRANSCOM. [COA]

SWEARINGEN, ROBERT J., *Understanding Evolved Expendable Launch Vehicle Capacity using an Arena Discrete-Event Simulation Model*. AFIT/OR/MS/ENS/11-22. Faculty Advisor: Lt Col Stephen P. Chambal. Sponsor: OSD. [COA]

TALAFUSE, THOMAS P., *Empirical Characterization of Ballistic Impact Flash*. AFIT/OR/MS/ENS/11-23. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: 46 TG. [COA]

THOMPSON, MICHAEL J., *Migration Issues in the Democratic Republic of Congo*. AFIT/OR/MS/ENS/11-24. Faculty Advisor: Dr. Richard F. Deckro. Sponsor: USSOCOM.

TURNQUIST, BROOKS R., *Fusion Schemes for Ensembles of Hyperspectral Anomaly Detection Algorithms*. AFIT/OR/MS/ENS/11-25. Faculty Advisor: Dr. Kenneth W. Bauer. Sponsor: NASIC. [COA]

YEE, FLORENCE K., *Depot-Level Simulation and Multivariate Analysis on B-1 High Velocity Maintenance*. AFIT/OR/MS/ENS/11-26. Faculty Advisor: Dr. John O. Miller. Sponsor: 591 SCMG. [COA]

YSEBAERT, STEPHANIE C., *An Analytical Approach to Low Observable Maintenance Practices using Simulation and Marginal Analysis*. AFIT/OR/MS/ENS/11-19. Faculty Advisor: Dr. Alan W. Johnson. Sponsor: ASC. [COA]

5.5.3. GRADUATE RESEARCH PAPERS

AXTELL, PETER G., *Value Focused Thinking Analysis of the Pacific Theater's Future Air Mobility En Route System*. AFIT/IMO/ENS/11-01. Faculty Advisor: Lt Col Joseph B. Skipper. Sponsor: HQ AMC. [COA]

BENTLEY, CASSIUS T., *Market Opportunity Analysis: Afghanistan Direct Delivery Strategic Opportunities*. AFIT/IMO/ENS/11-02. Faculty Advisor: Lt Col Doral E. Sandlin. Sponsor: HQ AMC. [COA]

BENTON, TERECA V., *Data Envelopment Analysis to Assess Productivity in the United States Air Force Medical Supply Chain*. AFIT/ILS/ENS/11-01. Faculty Advisor: Lt Col Joseph B. Skipper. Sponsor: AFMOA. [COA]

BLAND, MATTHEW G., *The Impact of CRAF Activation Risk on Long-Run International Routes*. AFIT/IMO/ENS/11-03. Faculty Advisor: Dr. Pamela S. Donovan. Sponsor: HQ AMC. [COA]

COOLEY, HEATHER D., *C-130 Programmed Depot Maintenance Processes*. AFIT/ILS/ENS/11J-02. Faculty Advisor: Dr. Alan W. Johnson. Sponsor: HQ AFMC. [COA]

FARRELL, PATRICK F., *Remotely Piloted Aircraft (RPA) Performing the Airdrop Mission*. AFIT/IMO/ENS/11-04. Faculty Advisor: Lt Col Joseph B. Skipper. Sponsor: HQ AMC. [COA]

GHAJ, RACHEL, *A Taxonomy for Insourcing in the Aerospace Industry*. AFIT/ILS/ENS/11-12. Faculty Advisor: Lt Col Timothy J. Pettit. Sponsor: N/A. [COA]

GILBERT, RONALD E., *Strategic Implications of US Fighter Force Reductions: Air-to-Air Combat Modeling Using Lanchester Equations*. AFIT/IOA/ENS/11-01. Faculty Advisor: Dr. John O. Miller. Sponsor: ACC/433 WPS. [COA]

HANFORD, JAMES R., *Effects of Contoured Pallets on AMC Mission Efficiency*. AFIT/IMO/ENS/11-05. Faculty Advisor: Dr. James T. Moore. Sponsor: HQ AMC. [COA]

HUGHES, JAROD C., *Direct Support of War Fighting Forces Using Apportioned Airlift*. AFIT/ILS/ENS/03-11. Faculty Advisor: Lt Col Joseph B. Skipper. Sponsor: HQ AMC. [COA]

JENSEN, TODD M., *The Impact of Coalition Movements on Airlift Projections*. AFIT/ILS/ENS/11-04. Faculty Advisor: Dr. William A. Cunningham. Sponsor: US TRANSCOM. [COA]

KLEIV, DAIN O., *Examination of Air Force Crash Damaged or Disabled Aircraft Recovery Program Resourcing*. AFIT/ILS/ENS/11-05. Faculty Advisor: Dr. William A. Cunningham. Sponsor: HQ USAF/A4. [COA]

LAROSE, AARON J., *Utilization of Decision Analysis for Service Member Retirement Options*. AFIT/IOA/ENS/11-02. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: N/A. [COA]

LESINKSI, WALTER J., III, *Tankering Fuel: A Cost Saving Initiative*. AFIT/IMO/ENS/11-06. Faculty Advisor: Dr. Alan W. Johnson. Sponsor: HQ AMC. [COA]

LINCK, SCOTT C., *Tanker Fuel Consolidation: Impact of Fuel Efficiency on ATO Resiliency*. AFIT/IMO/ENS/11-07. Faculty Advisor: Dr. Alan W. Johnson. Sponsor: HQ AMC. [COA]

LLANTADA, RONALD, *The Effects of Employing HVM on C-130 Aircraft at WR-ALC to Aircraft Availability*. AFIT/ILS/ENS/11-06. Faculty Advisor: Dr. William A. Cunningham. Sponsor: N/A. [COA]

LYNCH, PHILIP W., *Hybrid Airships: Intratheater Operations Cost-Benefit Analysis*. AFIT/IMO/ENS/11-08. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: USTRANSCOM. [COA]

MARKWART, TODD C., *A Study in Sea-Air Intermodal Port Selection: Strategic Decision Making for United States Southern Command*. AFIT/ILS/ENS/11-07. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: USTRANSCOM. [COA]

MAYER, BRIAN P., *Contingency Response Groups: An Analysis of Maintenance Training*. AFIT/IMO/ENS/11-09. Faculty Advisor: Dr. William A. Cunningham. Sponsor: N/A. [COA]

MCNEAL, TODD E., *Civil Reserve Air Flight - 60/40 Rule: The Case for a Reinstatement using Block Hours*. AFIT/IMO/ENS/11-10. Faculty Advisor: Dr. Pamela S. Donovan. Sponsor: HQ AMC. [COA]

MIRTICH, JOHN M., *Cost Index Flying*. AFIT/IMO/ENS/11-11. Faculty Advisor: Lt Col Doral E. Sandlin. Sponsor: HQ AMC. [COA]

MUSE, YIRA Y., *Use of Informal Networks to Resolve Logistics-related Issues in Humanitarian Assistance/Disaster Response*. AFIT/ILS/ENS/11-09. Faculty Advisor: Lt Col Sharon G. Heilmann. Sponsor: N/A. [COA]

OLSEN, CHRISTOPHER M., *Simulation Study of Evacuation Control Center Operations Analysis*. AFIT/IOA/ENS/11-04. Faculty Advisor: Dr. John O. Miller. Sponsor: EUCOM. [COA]

SCHEER, MARK A., *Noncombatant Evacuation Operations in USEUCOM*. AFIT/IOA/ENS/11-05. Faculty Advisor: Dr. John O. Miller. Sponsor: EUCOM. [COA]

SHEA, PHILLIP A., *Sea-Air Intermodal Port Pair Selection Criteria in South America*. AFIT/IMO/ENS/11-12. Faculty Advisor: Lt Col Doral E. Sandlin. Sponsor: USTRANSCOM. [COA]

SPERRY, THARON, *Delphic Analytic Hierarchy Goal Programming Process (A Multiple Goal, Multiple Objective Decision Making Approach): Case Study Political Decision Making on the African Airlift Partnership*. AFIT/IMO/ENS/11-13. Faculty Advisor: Dr. James T. Moore. Sponsor: SAF/IA. [COA]

TRICHE, WILLIAM P., *Dual Role Airlift: Fee for Service?* AFIT/IMO/ENS/11-14. Faculty Advisor: Dr. William A. Cunningham. Sponsor: HQ AMC. [COA]

UNDERWOOD, KENNETH D., *Minimizing the Risks of Diminishing Manufacturing Sources and Material Shortages: Evaluating Electronic Avionics Lifecycle Sustainment Strategies*. AFIT/ILS/ENS/11-10. Faculty Advisor: Dr. Jeffrey A. Ogden. Sponsor: N/A. [COA]

VANN, MATTHEW T., *C-5 Channel Delays: Analysis of Potential Causal Factors*. AFIT/IMO/ENS/11-15. Faculty Advisor: Dr. James T. Moore. Sponsor: HQ AMC. [COA]

WAHOSKE, TED A., *Cost Effectiveness Approach to B-1B Consumable and Reparable Procurement Strategies*. AFIT/ILS/ENS/11-11. Faculty Advisor: Dr. John O. Miller. Sponsor: AFGLSC. [COA]

WILSON, JAMES G., *Examining the Statistical Rigor of Test and Evaluation Results in the Live, Virtual and Constructive Environment*. AFIT/IOA/ENS/11-06. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: OSD. [COA]

WILSON, SANDRA J., *The Impact of Increased Pallet Utilization on Intra-Theater Airlift*. AFIT/IMO/ENS/11-16. Faculty Advisor: Dr. James T. Moore. Sponsor: HQ AMC. [COA]

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., LTC,

Assistant Professor of Operations Research, Department of Operational Sciences, AFIT Appointment Date 2010; Director, Center for Operational Analysis, appointment date, May 2011; BS, United States Military Academy, 1990; MS, Rensselaer Polytechnic Institute, 1999; MS, Rensselaer Polytechnic Institute, 1999; PhD, Boston University, 2005. LTC Ahner's research interest include applied probability, sequential decision making under uncertainty, model predictive control of complex UAV and sensor systems. Tel 937-255-6565 x4708 (DSN 785-6565 x4708), email: Darryl.Ahner@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

"A System of Equations to Capture SSTRO Dynamics." Sponsor: US Army. Funding: \$200,000 – Ahner 60%, Deckro 20%, Chrissis 20%. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Hackleman, A., Johnson, A., and Ahner, D. "Nuclear Enterprise Performance Measurement," Proceedings of the IIE Industrial Engineering Research Conference, Reno, NV, 22-24 May 2011. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Carl Parson and LTC Darryl Ahner, "Individual Deployer Personnel Analysis," 79th Military Operations Research Society Symposium, Monterey, CA, June 2011. Presented in WG 18 – Manpower and Personnel & WG 19 -Readiness. [COA]

Carl Parson and LTC Darryl Ahner, "Individual Deployer Personnel Analysis," 79th Military Operations Research Society Symposium, Monterey, CA, June 2011. Presented in WG 18 – Manpower and Personnel & WG 19 -Readiness. [COA]

MAJ Cade Saie and LTC Darryl Ahner, "Capturing the Interrelated Dynamics of Security, Stability, Transition and Reconstruction Operations" 79th Military Operations Research Society Symposium, Monterey, CA, June 2011. Presented in WG 10 – Joint Campaign Analysis & WG 22 – Measures of Merit. [COA]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Invited speaker, "A Practical Approach to Dynamic Programming," 79th MORSS Tutorial, Monterey, CA, 20 June 2011. [COA]

Co-chair of the Military Operation Research Society (MORS) Education and Professional Development Colloquium March 8-10 held at the Virginia Military Institute in Lexington, Virginia.

National Council of Examiners for Engineering and Surveying (NCEES) Fundamentals of Engineering Development Committee member.

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

SPONSOR FUNDED RESEARCH PROJECTS

“Advanced Research in Automatic Target Recognition.” Sponsor: NASIC. Funding: \$200,000. [COA]

REFEREED JOURNAL PUBLICATIONS

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 21, 2011, 1548512911403520, first published on April 21, 2011 doi:10.1177/1548512911403520. [COA]

Leap, N. J. and Bauer, K. W., “A confidence paradigm for classification systems.” Naval Research Logistics (NRL), Vol. 58, Issue 3, pp. 165-321, April 2011, n/a. doi: 10.1002/nav.20426. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Ryer, D., Bihl, T., Bauer, K., and Rogers, S., “QUEST hierarchy for hyperspectral face recognition,” SPIE Defense and Security Symposium, April 25-29, 2011, Orlando, FL. [COA]

Mindrup, F., Friend, M., Bauer, K., “Selecting training and test images for optimized anomaly detection and material identification algorithms in hyperspectral imagery through robust parameter design,” SPIE Defense and Security Symposium, April 25-29, 2011, Orlando, FL. [COA]

Mindrup, F., Bihl, T., and Bauer, K., "Modeling Noise in a Framework to Optimize the Detection of Anomalies in Hyperspectral Imaging," Artificial Neural Networks in Engineering Conference, Nov. 2010, Vol. 20, pages 517-524. [COA]

Williams, J., Bihl, T., and Bauer, K., "Mitigation of Correlation and Heterogeneity Effects in Hyperspectral Data," Artificial Neural Networks in Engineering Conference, Nov. 2010, Vol. 20, pages 501-507. [COA]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Program Chair, Operations Research Doctoral Program, Department of Operational Sciences.

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

CHAMBAL, STEPHEN P., Lt Col,

Associate Professor of Operations Research., Department of Operational Sciences, AFIT Appointment Dates: 1999-2003, 2008-2011 (AFIT/ENS); Director, Center for Operational Analysis (COA), 2008-2011; BS, United States Air Force Academy, 1993; MS, Arizona State University, 1995; PhD Arizona State University, 1999. Lt Col Chambal's research interests include discrete event simulation, decision analysis, and reliability, maintainability and availability analysis. Lt Col Chambal retired from active duty 1 August 2011 and is now serving in private industry.

SPONSOR FUNDED RESEARCH PROJECTS

“AFIT/ENS Support to the Air Force Applications Center.” Sponsor: AFTAC. Funding: \$5,200. [COA]

SPONSOR FUNDED EDUCATIONAL PROJECTS

“AF/A9 Combat Analyst Course Consultation (Revised).” Sponsor: HQ USAF. Funding: \$18,312. [COA]

“DOE Education Support for AFRL/R.Y.” Sponsor: AFRL/R.Y. Funding: \$5,000. [COA]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Editorial Review Board Member– *Military Operations Research*.

CHRISSIS, JAMES W.,

Associate Professor of Operations Research, Department of Operational Sciences, AFIT Appointment Date: 1987 (AFIT/ENS); BS, University of Pittsburgh, 1975; MS, Virginia Polytechnic Institute and State University, 1977; PhD, Virginia Polytechnic Institute and State University, 1980. Dr. Chrissis’ research interests include engineering optimization, mathematical programming, simulation, stochastic systems, and industrial engineering. Dr. Chrissis has been a member of the faculties of Virginia Tech and the University of South Florida. He is a member of the Institute for Operations Research and Management Sciences (INFORMS), The Society for Industrial and Applied Mathematics (SIAM), the Military Operations Research Society (MORS), The American Institute for Aeronautics and Astronautics (AIAA), and Sigma Xi. Tel. 937-255-3636 x4606 (DSN 785-3636 x4606), email: James.Chrissis@afit.edu

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

J. Hamilton and J. Chrissis, “Determining Pilot Manning for Bomber Longevity,” WG-18, 79th MORSS, Monterey, CA, 23 June 2011. [COA]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Program Chair, Master of Science in Operations Research, Department of Operational Sciences.

Senior Member American Institute of Aeronautics and Astronautics (AIAA).

President, Cincinnati-Dayton Chapter of the Institute for Operations Research and the Management Sciences (INFORMS).

Military Cluster Coordinator, Midwest INFORMS Conference, 1-2 August 2011.

MDO Technical Committee Secretary, AIAA Multidisciplinary Design Optimization (MDO) Technical Committee.

Invited Speaker, "Stochastic Optimization," 79th MORSS Tutorial, Monterey, CA, 20 June 2011.

Reviewer, *European Journal of Operational Research*.

Reviewer, *Simulation*.

Reviewed papers for the MDO sessions at the January 2011 AIAA Aerospace Sciences Meeting in Orlando, FL.

Reviewed papers for the April 2011 AIAA SDM Conference/MDO Specialist Conference in Denver, CO.

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

REFEREED JOURNAL PUBLICATIONS

Broyles, J.R., Cochran, J.K., and Montgomery, D.C., "A Statistical Markov Chain Approximation of Transient Hospital Inpatient Inventory," *European Journal of Operations Research* 207:3, pp. 1645-1657 (Nov 2010). [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Cochran, J.K. and Burdick, T.L., "The Impact of the Door-to-Doc Emergency Department Patient Flow Model," IIE Industrial Engineering Research Conference, Paper 610 (6 pages) on CD-ROM, Reno, NV (May 2011). [COA]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Editorial Board: *Computers in Industry*, *Journal of Design and Manufacturing Automation*, *International Journal of Simulation and Process Modeling*, *International Journal of Industrial and Systems Engineering*, *International Journal of Mathematics in Operational Research*.

Senior Member of the Institute of Industrial Engineering.

Senior Member of the Society for Computer Simulation.

Member, Council of Industrial Engineering Department Heads, CIEDH, of the Institute of Industrial Engineers professional society, representing the Department of Operational Sciences, Air Force Institute of Technology.

Member, Association of Chairs of Operations Research Departments, ACORD, of the INFORMS professional society, representing the Department of Operational Sciences, Air Force Institute of Technology.

Program Committee, IASTED International Conferences on Modeling and Simulation.

Session Chair, IERC National Conference, "Modeling and Simulation of Emergency Departments – I," Healthcare Systems Engineering Track, May 2011.

Initiated a USAF-wide audit of military healthcare delivery Ops problems and their owners leading to an understanding of the USAF Medical Roadmap (OPR: AMC/SG) and the Aeromedical Evacuation Roadmap (OPR: A3O).

Participated in the National Science Foundation's extramural funding proposal reviewer pool.

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

SPONSOR FUNDED RESEARCH PROJECTS

“Leading Edge Supply Chain: Identifying Ways to Improve Weapon System Sustainment and Logistics Support.” Sponsor: AFRL/RX. Funding: \$300,000 – Cunningham 25%, Skipper 50%, Donovan 25%. [COA]

REFEREED JOURNAL PUBLICATIONS

John E. Bell, Stanley Griffis, William A. Cunningham III, Jon A. Eberlan, “Location Optimization of Strategic Alert Sites for Homeland Defense,” *Omega*, 39 (2011), pp. 151-158. [COA]

Skipper, Joseph B., John E. Bell, William A. Cunningham, and Daniel D. Mattioda (2010), “Forward Positioning and Consolidation of Strategic Inventories,” *Journal of Transportation Management*, Vol. 21, No. 1, pp. 27-41. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

John Bell, Joseph Skipper, William Cunningham, Daniel Mattioda, “Locating and Consolidating Strategic Inventory,” Western Decision Sciences Institute annual Meeting, Portland, OR, April 5-8, 2011. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

William Cunningham, Ryan Rowe, Ben Skipper, “Optimal CV-22 Centralized Intermediate Repair Facility Locations and Parts Repair,” INFORMS annual meeting, Austin, TX, November 7-10, 2010. [COA]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Program Chair, Graduate Logistics and Supply Chain Management program, Department of Operational Sciences.

Editorial Review Board, *Air Force Journal of Logistics*.

Editorial Review Board, *Journal of Transportation Management*.

Book reviewer for *Army Logistician*.

Examiner for Transportation and Economics Module for Certified Transportation and Logistics (CTL) certification for American Society of Transportation and Logistics (AST&L).

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

SPONSOR FUNDED RESEARCH PROJECTS

“AFIT Analysis Support to JIEDDO.” Sponsor: JIEDDO. Funding: \$58,273.

REFEREED JOURNAL PUBLICATIONS

John E. Hebert and Richard F. Deckro, "Combining Contemporary and Traditional Project Management Tools to Resolve a Project Scheduling Problem," *Computers & Operations Research*, Volume 38, Issue 1, January 2011, Pages 21-32.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

James F. Morris, Keith Anthony, Maj Kevin T. Kennedy, and Richard F. Deckro, "Extraction Distractions: A Comparison of Social Network Model Construction Methods," Proceedings of the 2011 European Intelligence and Security Informatics Conference, Ed by Nasrullah Memon and Daniel Zeng (2011), pp. 273-276.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Capt. Brandon Bernardoni, Dr. Richard Deckro, Maj. Matthew Robbins, "Utilizing Social Network Analysis in Support of Nation Building," 79th Military Operations Research Society Symposium, Monterey, CA, June 2011. Presented in WG 33 - Social Science Methods and Application & WG 34 -Computational Social Sciences.

Capt Ryan McGuire and Richard F. Deckro, "Modeling Cell Phone Networks as Multi-Layered Networks," 79th Military Operations Research Society Symposium, Monterey, CA, June 2011. Presented in WG 31- Information and Cyber Operations & WG 34 - Computational Social Sciences.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Editor, Military Operations Research.

Reviewer: *Computers & Industrial Engineering*, *Computers & Operations Research*, *Journal of Engineering Manufacture*, *Journal of Risk and Reliability*, Chapter for *Community Based Operations Research*, Book proposal for John Wiley & Sons.

Member, MORS Publication Committee.

Member, MORS Heritage Committee.

Member, Peacekeeping and Stability Operations Institute Academic Consortium.

Served as one of three judges for the US Army's 2011 Dr. Wilbur B. Payne Memorial Award for Excellence in Analysis.

Evaluation panelist for research proposals for the Department of Homeland Security, 19 - 20 April, 2011 Washington, DC.

James F. Morris, Jerome W. O'Neal and Richard F. Deckro, "The Prescribed Node Degree, Connected Graph (PNDCG) Algorithm: A Random Graph Generation Algorithm for Social Network Analysis," FOIL Technical Report 10-01, 2010.

DONOVAN, PAMELA S.,

Assistant Professor of Logistics and Supply Chain Management, Department of Operational Sciences, AFIT
Appointment Dates: 2006-2011 (AFIT/ENS); BS, Kent State University, 1986; MS, Air Force Institute of Technology, 1996; PhD, University of Maryland, 2006. Dr. Donovan's research interests include inventory modeling, distribution processes, supply chain integration, and transportation. As of August 2011, Dr. Donovan is on faculty at the University of North Texas.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Program Chair, Supply Chain Management Certificate, Department of Operational Sciences.

FRIEND, MARK A., Maj,

Assistant Professor of Operations Research, Department of Operational Sciences, AFIT Appointment Date: 2010 (AFIT/ENS); Chief, Operations Research Division; BS, Computer Science, Texas Christian University, 1996; MS, Operations Research, Air Force Institute of Technology, 1998; PhD, Operations Research, Air Force Institute of Technology, 2007. Major Friend's research interests include pattern recognition techniques applied to the area of automatic target recognition, applied multivariate statistics, and mobility modeling and analysis. Tel. 937-255-3636 x4624 (DSN 785-3636 x4624), email: Mark.Friend@afit.edu

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Mindrup, F., Friend, M., Bauer, K., "Selecting training and test images for optimized anomaly detection and material identification algorithms in hyperspectral imagery through robust parameter design," SPIE Defense and Security Symposium, April 25-29, 2011, Orlando, FL. [COA]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Secretary for Cincinnati-Dayton Chapter of Institute for Operations Research and Management Sciences (INFORMS).

Reviewer - *International Journal of Electronics and Communications*.

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

SPONSOR FUNDED RESEARCH PROJECTS

"Research, Analysis and Transition Support to the Director of Logistics and Sustainment Air Force Material Command." Sponsor: HQ AFMC. Funding: \$350,000. [COA]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Chief, Logistics Division, Department of Operational Sciences.

Reviewer, *Human Resource Management Journal*.

Reviewer, 2011, Academy of Management Annual Conference, San Antonio, TX.

Reviewer, 2011, Organizational Behavior Teaching Conference for Management Educators, Marquette University, WI.

Reviewer, 2011, Midwest Academy of Management.

Lead Facilitator for AFIT Commandant's Literary Colloquium.

HILL, RAYMOND R.,

Professor of Operations Research, Department of Operational Sciences, AFIT Appointment Dates: 1997-2002, 2008 (AFIT/ENS); BS, Mathematics, Eastern Connecticut State University, 1983; MS, Operations Research, Air Force Institute of Technology, 1988; PhD, Industrial and Systems Engineering, The Ohio State University, 1996. Dr. Hill's research interests include applied statistics, experimental design, design and analysis of heuristics, applied optimization modeling and applied simulation modeling to include use of agent-based modeling methods. Tel. 937-255-6565 x7469 (DSN 785-6565 x7469), email: Raymond.Hill@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

"The Science of Test: Advanced Test and Evaluation in Support of the DOD Test and Evaluation Enterprise."
Sponsor: OSD. Funding: \$560,000. [COA]

REFEREED JOURNAL PUBLICATIONS

Heath, B. L. and R. R. Hill, 2010. "Some Insights into the Emergence of Agent-Based Modeling," *Journal of Simulation* Vol. 4, No. 3, 163-169. [COA]

Johnson, A. W., T. Heiman, M. Cooper, and R. R. Hill. "Assessing Transport Aircraft Inspection Strategies," *International Journal of Operations Research and Information Systems (IJORIS)*. Vol. 1, No. 4, 1-21. October-December 2010. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

MacKenzie, A., Miller, J. O. and Hill, R. R. 2010. "An Exploration of the Effects of Maintenance Manning on Combat Mission Readiness Utilizing Agent Based Modeling," Proceedings of the 2010 Winter Simulation Conference, ed Johansson, Jain, Montoya-Torres, Yucsan and Hagan. IEEE, Piscataway, NJ. [COA]

Talafuse, Thomas, Hill, R. R. and Bestard, J. April 2011. "Characterization of Ballistic Impact Flashes Empirical Model Development," Proceedings of the 52nd AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, Denver CO, April 4-7, 2011. [COA]

Talafuse, Thomas, Hill, R. R. and Bestard, J. May 2011. "Characterization of Ballistic Impact Flashes for Survivability Analyses Based on Empirical Models," Proceedings of the 2011 Industrial Engineering Research Conference, Reno NV, May 21-25, 2011. [COA]

Haase, Casey and Hill, R. R. May 2011. "Applying Experimental Design to Live, Virtual, and Constructive (LVC) Environments," Proceedings of the 2011 Industrial Engineering Research Conference, Reno NV, May 21-25, 2011. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Hill, R. R. May 2011. "Military Use of Experimental Design," Proceedings of the 2011 Industrial Engineering Research Conference, Reno NV, May 21-25, 2011. [COA]

Leggio, D., Hill, R. R., Capehart, S., Rosener, A. G. June 2011. "A Monte Carlo Study Examining the Potential of Experimental Design Strategies for Wind Tunnel Testing," Proceedings of the 2011 Quality and Productivity Research Conference, Roanoke, VA, June 7-9, 2011. [COA]

BOOKS AND CHAPTERS IN BOOKS

Hill, Raymond R. and Edward A. Pohl, "Heuristics and Their Use in Military Modeling" book chapter, Encyclopedia of Operations Research and Management Science, edited by James Cochran, Wiley Publishing, 2010. [COA]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Assistant Program Chair, Operations Research Doctoral Program, Department of Operational Sciences.

Program Chair, Test and Evaluation Certificate, Department of Operational Sciences.

Chair, AFIT Graduate School Promotion and Tenure Committee.

AFIT Graduate School Oak Ridge Institute for Science and Education Program Coordinator.

Hill, R. R. 2010. Guest Editorial: Introduction to the Special Issue, *Journal of Simulation*, Vol. 4, No. 3, 149-150. [COA]

Hill, R. R. 2010. Book Review: "Managing Business Complexity: Discovering Strategic Solutions with Agent-Based Modeling and Simulation," *Journal of Simulation*, Vol. 4, No. 3, 211-212. [COA]

Associate Editor: *International Journal of Mathematics in Operations Research*, *Journal of Defense Modeling and Simulation*, *Military Operations Research*, *Naval Research Logistics*.

2010 Winter Simulation Conference Military Track Coordinator.

2010 Winter Simulation Conference Session Chair.

Session chair, Industrial Engineering Research Conference 2011, Operations Research Track, Data Mining Session.

Session chair, Industrial Engineering Research Conference, 2011, Tutorial, DOE in the Military.

Session Organizer and Chair, 16th Annual ITEA LVC Conference, Theory of V&V Session.

Presentation: Experimental Design in a LVC Test Environment, 16th Annual ITEA LVC Conference, El Paso Texas, January 27, 2011 with Capt Casey Haase. [COA]

OSD committee membership on Science of Test.

Journal Reviewer, IJPR, JOS, EJOR, MOR, NRL, COR, AEAT, COR JOS, JDMS.

Reviewer, 2011 Industrial Engineering Research Conference (IERC).

JOHNSON, ALAN W.,

Associate Professor of Logistics and Supply Chain Management, Department of Operational Sciences, AFIT
Appointment Date: 2004 (AFIT/ENS); BS, Mechanical Engineering, Montana State University, 1982; MS, Systems Management, Air Force Institute of Technology, 1989; PhD, Industrial and Systems Engineering, Virginia Polytechnic Institute and State University, 1996. Dr. Johnson's research interests include all aspects of military logistics, strategic airlift, space logistics, mobility, discrete-event simulation, logistics management, reliability and maintainability, and discrete optimization and heuristics. Tel. 937-255-3636 x4703 (DSN 785-3636 x4703), email: Alan.Johnson@afit.edu

REFEREED JOURNAL PUBLICATIONS

Johnson, A., Heiman, T., Cooper, M., and Hill, R., 2010, "Assessing Transport Aircraft Inspection Strategies," *International Journal of Operations Research and Information Systems* 1(4):1-21. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Hackleman, A., Johnson, A., and Ahner, D. "Nuclear Enterprise Performance Measurement," Proceedings of the IIE Industrial Engineering Research Conference, Reno, NV, 22-24 May 2011. [COA]

Boykin, S., Jordan, J., and Johnson, A., "Operations Support with a Virtual Space Logistics Readiness Center," Proceedings of the American Institute of Aeronautics and Astronautics Space 2010 Conference, Anaheim CA, 2010, AIAA-2010-8865. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

INFORMS National Meeting, November 7-10 2010, Austin TX (M. Toydas, A. Johnson, and D. Sandlin), "Fuel Savings Opportunities from Air Refueling." [COA]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Program Chair, Logistics Doctoral Program, Department of Operational Sciences.

Associate Editor, *IIE Transactions*.

Editorial Board, *International Journal of Operations Research and Information Systems (IJORIS)*.

Secretary/Treasurer, Military Applications Society, Institute for Operations Research and Management Sciences (INFORMS).

Chair, Space Logistics, Technical Committee, American Institute of Aeronautics and Astronautics.

Tutorials Track co-chair, IIE Industrial Engineering Research Conference, Reno, NV, 22-24 May 2011.

Session Chair (4 presentations), IIE Industrial Engineering Research Conference, Reno, NV, 22-24 May 2011.

Session Chair (4 presentations), INFORMS National Meeting, Nov 7-10 2010, Austin TX.

Presentation to Air Force Chief Scientist, 4 May 2011, "AFIT - Air Mobility Command Fuel Efficiency Research." [COA]

Reviewer, *European Journal of Operational Research*.

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); 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

REFEREED JOURNAL PUBLICATIONS

Skipper, Joseph B., John E. Bell, William A. Cunningham, and Daniel D. Mattioda (2010), "Forward Positioning and Consolidation of Strategic Inventories," *Journal of Transportation Management*, Vol. 21, No. 1, pp. 27-41. [COA]

Barman, Samir, Daniel D. Mattioda, and Warren K. Fisher (2010), "Controlled Release Location of Jobs in a Hybrid of Job and Flow Shops," *International Journal of Advanced Operations Management*, Vol. 2, No.3/4 pp. 162-184. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Park, A., Miller, J.O., and Mattioda, D. "Simulation Analysis of High Velocity Maintenance for the B-1B," Proceedings of the 2011 Industrial Engineering Research Conference, Reno, Nevada, 21-25 May 2011. [COA]

John Bell, Joseph Skipper, William Cunningham, Daniel Mattioda, "Locating and Consolidating Strategic Inventory," Western Decision Sciences Institute annual Meeting, Portland, OR, April 5-8, 2011. [COA]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Program Chair, Master of Science in Logistics (Air Mobility), Department of Operational Sciences.

Logistics Track Chair; Huntsville Simulation Conference, Huntsville, AL., Oct 2010.

MILLER, JOHN O.,

Associate Professor of Operations Research, Department of Operational Sciences, AFIT Appointment Date: 2002 (AFIT/ENS); Deputy Department Head; Director, Combat Modeling Laboratory; BS, United States Air Force Academy, 1980; MBA, University of Missouri at Columbia, 1983; MS, Air Force Institute of Technology, 1987; PhD, The Ohio State University, 1997. Dr. Miller's research interests include simulation, ranking and selection, combat modeling, and nonparametric statistics. Tel. 937-255-6565 x4326 (DSN 785-6565 x4326), email: John.Miller@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

"Research, Analysis and Transition Support to the Air Force Global Logistics Support Center." Sponsor: AFLGSC. Funding: \$208,400 – Miller 70%, Pettit 30%. [COA]

"Analysis of Noncombatant Evacuation Operations." Sponsor: USEUCOM. Funding: \$71,940. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Mackenzie, A. S., Miller, J.O., and Hill, R. R. "An Exploration of the Effects of Maintenance Manning on Combat Mission Readiness Utilizing Agent Based Modeling," Proceedings of the 2010 Winter Simulation Conference, ed. B. Johansson, S. Jain, J. Montoya-Torres, J. Huan, and E. Yucesan. [COA]

Park, A., Miller, J.O., and Mattioda, D. "Simulation Analysis of High Velocity Maintenance for the B-1B," Proceedings of the 2011 Industrial Engineering Research Conference, Reno, Nevada, 21-25 May 2011. [COA]

Parson, C.R., Miller, J.O., and Weir, J.D. "Assessing Factors that Impact TNMCS for the B-1 Bomber," Proceedings of the 2011 Industrial Engineering Research Conference, Reno, Nevada, 21-25 May 2011. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Parson, C.R., Miller, J.O., and Weir, J.D. "Simulation Modeling and Analysis of TNMCS for the B-1 Strategic Bomber," A2L2 Conference, St. Louis, MO, 6-9 Dec 2010. [COA]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Associate Editor, *International Journal of Operations Research*.

Session Chair, Logistics and Mobility as part of the Military Track of the Dec 2010 Winter Simulation Conference in Baltimore MD.

Tutorials Track co-chair, IIE Industrial Engineering Research Conference, Reno, NV, 22-24 May 2011.

Chaired I-SIM sponsored session on Modeling of Military Systems and presented a briefing on Simulation and Analysis of USAF Maintenance and Supply Processes for the B-1 Bomber (highlighting two research theses sponsored by the AFGLSC) at the Conference for the International Federation of Operational Research Societies in Melbourne Australia from 10-15 July 2011. [COA]

Served as a modeling expert on the accreditation panel for the Joint Future Theater Lift (JFTL) Technology Study Accreditation Conference held 19-20 January 2011 at AFRL/RB.

Journal referee, *Military Operations Research*.

Journal referee, *International Journal of Logistics: Research and Applications*.

Journal referee, *The Journal of Defense Modeling and Simulation*.

Member AF Modeling and Simulation Workforce Development Working Group.

MOORE, JAMES T.,

Professor of Operations Research, Department of Operational Sciences, AFIT Appointment Dates: 1990-1998, 1998 (AFIT/ENS); Head, Department of Operational Sciences, 1 Jan-6 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.

SPONSOR FUNDED RESEARCH PROJECTS

"JDPAC and AFIT Distribution Research Proposal (LOC)." Sponsor: USTRANSCOM. Funding: \$500,000. [COA]

REFEREED JOURNAL PUBLICATIONS

Nance, R. L., A.G. Roesener, J.T. Moore, "An Advanced Tabu Search Approach to Solving the Mixed Payload Aircraft Loading Problem," *Journal of Operational Research Society* 62 (2): 337-347 (2011). [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

"Optimizing Ground Times for AMC Aircraft in Afghanistan" by Maj Eric Bucheit and Dr. James T. Moore Military Operations Research Society Symposium, Naval Postgraduate School, Monterey California, 21-23 June 2011. [COA]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Program Chair, Master of Science in Operations Research, Department of Operational Sciences.

Editorial Board, *Military Operations Research*.

Editorial Board, *International Journal of 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

SPONSOR FUNDED RESEARCH PROJECTS

"ECSS Research." Sponsor: ECSS. Funding: \$39,143. [COA]

"The Insourcing Cycle Shift: Applying the Triple Helix Model to Analyze the Effects of Multi-dimensional Influential Factors on the Purchasing Function." Sponsor: AFGLSC. Funding: \$33,096 – Ogden 70%, Pettit 10%, Johnson 10%, Miller 10%. [COA]

REFEREED JOURNAL PUBLICATIONS

Foster, S.T., Wallin, C., and Ogden, J.A. (2011) "Towards a better understanding of supply chain quality management practices," *International Journal of Production Research*, Vol. 49, No. 8, 2285-2300. [COA]

Ogden, J.A., Wallin, C., and Foster, S.T. (2010) "On Baldrige Core Values and Commitment to Quality," *Quality Management Journal*, Vol. 17, No. 3, 21-34. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Sprague, T.M., Ogden, J.A., and Hartman, P.L. (2011) "Achieving Enterprise Resource Planning (ERP) Success Through Focused End-User Education and Training Strategies," published as a full paper and presented at the 21st Annual North American Research Symposium on Purchasing and Supply Chain Management, San Diego, California, March 2011. [COA]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Program Chair, Master of Science in Logistics (Air Mobility), Department of Operational Sciences.

Session chair, ISM's 2011 North American Research Symposium.

AFIT Graduate School Chairman, Curriculum Development Review Committee.

Reviewer: *Journal of Supply Chain Management*, *International Journal of Operations & Production Management*, *International Journal of Production Economics*, *Supply Chain Forum: An International Journal*.

Reviewed papers for ISM's 2011 North American Research Symposium.

PETTIT, TIMOTHY J., Lt Col,

Assistant Professor of Logistics and Supply Chain Management, Department of Operational Sciences AFIT Appointment Date: 2008 (AFIT/ENS); Deputy Department Head; BS, Aerospace Engineering, Iowa State University, 1991; MS, Logistics Management, Air Force Institute of Technology, 1996; PhD, Business Administration (Logistics), The Ohio State University, 2008. Lt Col Pettit's research interests are in supply chain resilience, risk management, supply chain management, and process improvement. As of July 2011, Lt Col Pettit is on faculty at the United States Air Force Academy.

SPONSOR FUNDED RESEARCH PROJECTS

“Research, Analysis and Transition to the 478th Aeronautical Systems Group.” Sponsor: 478th AESG.
Funding: \$766,000 – Pettit 40%, Hill 20%, Mattioda 20%, Sandlin 20%. [COA]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Received Honorable Mention in the Bernard J. La Londe Best Paper competition, presented at the 2011 Council of Supply Chain Management Professionals (CSCMP) Conference, recognized as one of the top 3 papers published by the *Journal of Business Logistics* in 2010. Journal article: “Ensuring Supply Chain Resilience: Development of a Conceptual Framework,” with Joseph Fiksel and Keely L. Croxton, *Journal of Business Logistics*, Spring 2010, Vol. 31, No. 1, pp. 1-21. [COA]

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

SPONSOR FUNDED RESEARCH PROJECTS

“NATC-A Transition Assessment Study.” Sponsor: NATC-A. Funding: \$87,200. [COA]

“Summer Program for Operations Research Technology (SPORT), Distinguished Visiting Professor (DVP).” Sponsor: NSA. Funding: \$26,000.

REFEREED JOURNAL PUBLICATIONS

Robbins, M.J., Jacobson, S.H., 2011, “Pediatric Vaccine Procurement Policy: The Monopsonist’s Problem,” *Omega*, 39. [COA]

Robbins, M.J., Jacobson, S.H., Sewell, E.C., 2010, “Pricing Strategies for Combination Pediatric Vaccines and their Impact on Market Share: Pediarix or Pentacel?” *Health Care Management Science*, 13(1). [COA]

Nikolaev, A.G., Robbins, M.J., Jacobson, S.H., 2010, “Evaluating the Impact of Legislation Prohibiting Hand-Held Cell Phone Use While Driving,” *Transportation Research Part A: Policy and Practice*, 44. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Robbins, M. J., Jacobson, S.H., “The Altruistic Monopsonist Vaccine Formulary Pricing and Purchasing Problem,” 2010 INFORMS National Meeting, November 7-10, 2010, Austin, TX. [COA]

Robbins, M. J., Shanbhag, U.V., Jacobson, S.H., “The Weighted Set Covering Game: A Vaccine Pricing Model For Pediatric Immunization,” 2010 INFORMS National Meeting, November 7-10, 2010, Austin, TX. [COA]

Nikolaev, A.G., Robbins, M.J., Jacobson, S.H., “Evaluating the Impact of Legislation Prohibiting Hand-Held Cell Phone Use While Driving,” 2010 INFORMS National Meeting, November 7-10, 2010, Austin, TX. [COA]

Capt. Brandon Bernardoni, Dr. Richard Deckro, Maj. Matthew Robbins, “Utilizing Social Network Analysis in Support of Nation Building,” 79th Military Operations Research Society Symposium, Monterey, CA, June 2011. Presented in WG 33 - Social Science Methods and Application & WG 34 -Computational Social Sciences. [COA]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Distinguished Visiting Professor, Summer Program for Operations Research Technology (SPORT), National Security Agency, May 2011 – August 2011.

Abbas, A., Herring, S., Robbins, M., Simms, K., Spetzler, C. “Peer-To-Peer Decision Training: Teaching Decision Skills to Troubled Teens,” *OR/MS Today*, 38(4). [COA]

Reviewer: *Health Care Management Science, Operations Research, Military Operations Research, Naval Research Logistics, Transportmetrica.*

2010 INFORMS Pierskalla Best Paper Award – Finalist. The annual Pierskalla Best Paper Award recognizes research excellence in the field of health care management science.

SANDLIN, DORAL E., Lt Col,

Assistant Professor of Logistics and Supply Chain Management, Department of Operational Sciences, AFIT Appointment Date: 2010 (AFIT/ENS); Chief, Logistics Division; BS, Civil Engineering, US Air Force Academy, 1992; MBA, Business, Rutgers University, 2004; MLM, Logistics and Supply Chain Management, Air Force Institute of Technology, 2006; MA, Logistics Management, The Ohio State University, 2009; PhD, Logistics, The Ohio State University, 2010. Lt Col Sandlin’s research interests include transportation selection models, cross-functional integration, and logistics strategy. As of March 2011, Lt Col Sandlin is serving in Iraq.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Jordan, J. Weir, JD, and Sandlin, DE, “A Value-Focused Network Optimization Solution for Transportation Mode Selection,” Western Decision Science Annual Meeting 2011, Portland, OR. [COA]

Jordan, J., Weir, JD, and Sandlin, DE, “Multiobjective Decision Programming for the Multiobjective Minimum Cost Flow Problem,” Industrial Engineers Research Conference 2011, Reno, NV. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

INFORMS National Meeting, November 7-10 2010, Austin TX (M. Toydas, A. Johnson, and D. Sandlin), “Fuel Savings Opportunities from Air Refueling.” [COA]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Interim Head, Department of Operational Sciences (Nov-Dec, 2010).

Program Chair, Master of Science in Logistics (Air Mobility), Department of Operational Sciences.

SKIPPER, JOSEPH B., Maj,

Assistant Professor of Logistics and Supply Chain Management, Department of Operational Sciences, AFIT Appointment Date: 2008 (AFIT/ENS); Deputy Director, Center for Operational Analysis (COA); BS, Troy State University, 1992; MS, Air Force Institute of Technology, 2002; PhD, Auburn University, 2008. Maj Skipper’s research interests include supply chain management, supply chain disruptions, organizational flexibility and resilience, and disruption avoidance. As of August 2011, Lt Col Skipper is serving at Langley Air Force Base, Virginia.

REFEREED JOURNAL PUBLICATIONS

Skipper, Joseph B., John E. Bell, William A. Cunningham, and Daniel D. Mattioda (2010), "Forward Positioning and Consolidation of Strategic Inventories," *Journal of Transportation Management*, Vol. 21, No. 1, pp. 27-41. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Bell, John, Joseph Skipper, William Cunningham, and Daniel Mattioda (2011), "Locating and Consolidating Strategic Inventory," Western Decision Science Institute Annual Meeting, Portland, OR. [COA]

Lanier, Christopher and Joseph B. Skipper (2011), "Supply Chain Synchronization: Improving Distribution Velocity from the United States to Iraq," Western Decision Science Institute Annual Meeting, Portland, OR. [COA]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Program Chair, Master of Science in Logistics, Department of Operational Sciences.

Session Chair, Western Decision Sciences Institute, Military Applications, Portland, OR, April 5-8, 2011.

Reviewer, *Journal of Organizational and End User Computing*.

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

REFEREED JOURNAL PUBLICATIONS

Thomas, M.U., "Warranty modeling," *Wiley Encyclopedia of Operations Research and Management Science*, J.J. Cochran, Ed., Wiley, 2011.

Thomas, M.U., "Aggregation and lumpability of DTMCs," *Wiley Encyclopedia of Operations Research and Management Science*, J.J. Cochran, Ed., Wiley, 2010.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

“A Tutorial on Markov Chain Modeling,” Midwest INFORMS Regional Conference, Columbus, OH, August 1-2, 2011.

“Planning and Managing Logistics Support Operations: A Method for Quantifying Mission Effectiveness,” University of Arkansas, Mack-Blackwell Rural Transportation Center and Department of Industrial Engineering, Distinguished Lecture, July 7, 2011.

“Toward an Integrated Product Quality System,” Department of Industrial and Operations Engineering, University of Michigan, October 15, 2010.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

National Research Council, 2011,” 2009-2010 Assessment of the Army Research Laboratory,” The National Academies Press, Washington, DC (Panel).

Ohio State University, Department of Integrated Systems Engineering, 2010.

National Research Council – Panel on Survivability/Lethality Analysis, 2010-2011.

Dayton Area Graduate Studies Institute, Operations Committee.

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

SPONSOR FUNDED RESEARCH PROJECTS

“Research, Analysis and Transitional Support to the United States Strategic Command Joint Force Component Command for Intelligence, Surveillance and Reconnaissance (JFCC-ISR).” Sponsor: STRATCOM. Funding: \$40,000 – Weir 90%, Chabral 10%. [COA]

REFEREED JOURNAL PUBLICATIONS

Bell J. E., and Weir, J. D., “Location Analysis: Application of ReVelle and Rosing’s Roman Empire Problem,” *Decision Sciences Journal of Innovative Education*, 2010. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Jordan, J. Weir, JD, and Sandlin, DE, “A Value-Focused Network Optimization Solution for Transportation Mode Selection,” Western Decision Science Annual Meeting 2011, Portland, OR. [COA]

Jordan, J., Weir, JD, and Sandlin, DE, “Multiobjective Decision Programming for the Multiobjective Minimum Cost Flow Problem,” Industrial Engineers Research Conference 2011, Reno, NV. [COA]

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Hu, BA, Weir, JD, and Wu, T, “Decentralized Operation Strategies for Integrated Building Energy System,” Industrial Engineers Research Conference 2011, Reno, NV. [COA]

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Program Chair, Master of Science in Operational Analysis, Department of Operational Sciences.

Invited speaker at Arizona State University Graduate Student Guest Lecture Series.

Invited Speaker, Decision Analysis Society, Gutman, A. and Weir, J.D., "Sensitivity Analysis of Decision Models via Random Sampling of Vectors in a Bounded Region," INFORMS Annual Meeting, Austin TX, Nov 2010. [COA]

Session Chair Industrial Engineering Research Conference (IERC) 2010.

Reviewer, *Journal of the Military Operations Research Society*.

Reviewer, *European Journal of Operations Research*.

5.6. DEPARTMENT OF SYSTEMS AND ENGINEERING MANAGEMENT

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5.6.1. MASTER'S THESES

- AMIRAULT, PHILIP & NUHU, ABDUL-RAZAK, *Systems Engineering Plan for High Powered Microwave System Development*. AFIT/GSE/ENV/10-D01DL. Faculty Advisor: Dr. David R. Jacques. Sponsor: AFRL/RD.
- BECKETT, EDWARD & SHIN, HYOUNGJIN, *A Systems Architecture and Advanced Sensors Application for Real-time Aircraft Structural Health Monitoring*. AFIT/GSE/ENV/11-M04. Faculty Advisor: Dr. Som R. Soni. Sponsor: AFRL/RX.
- BLACK, JON E., *Evaluation of XMX/2L-MIL Virtual Impactor Performance and Capture and Retention of Aerosol Particles in Two Different Collection Media*. AFIT/GIH/ENV/11-M01. Faculty Advisor: Lt Col Dirk P. Yamamoto. Sponsor: 711 HPW/USAFSAM.
- BOEHMKE, BRADLEY C., *Model for Identifying Cost Savings by Synchronizing the E-4B NAOC Replacement and Presidential Aircraft Recapitalization Programs*. AFIT/GCA/ENV/11-J01. Faculty Advisor: Dr. Adedeji B. Badiru. Sponsor: ASC.
- BOHREN, JAMES S. & HOWARD, JOHN K., *Solar Warning Architecture for Manned Missions to Mars*. AFIT/GSE/ENV/11-J01DL. Faculty Advisor: Dr. John M. Colombi. Sponsor: N/A.
- BOIRE, JEREMY P., *Autonomous Routing of Unmanned Aerial Vehicle (UAV) Relays to Mimic Optimal Trajectories in Real Time*. AFIT/GSE/ENV/11-M03. Faculty Advisor: Dr. David R. Jacques. Sponsor: AFRL/RB.
- BROWER, WADE W., *A Study of Corporate Entrepreneurship in a Department of Defense Organization*. AFIT/GEM/ENV/11-M01. Faculty Advisor: Lt Col John J. Elshaw. Sponsor: AFRL/RX.
- BROWNHEIM, SITAO V., *Characterization and In Vitro Toxicity of Copper Nanoparticles (Cu-NPs) in Murine Neuroblastoma (N2A) Cells*. AFIT/GES/ENV/11-M01. Faculty Advisor: Dr. Charles A. Bleckmann. Sponsor: 711 HPW/USAFSAM.
- CALVER, TIMOTHY I., *An Empirical Analysis of the Cascade Secret Key Reconciliation Protocol for Quantum Key Distribution*. AFIT/GIR/ENV/11-S01. Faculty Advisor: Dr. Michael R. Grimala. Sponsor: N/A.
- CHUN, WOO-SUK, *Life Cycle Assessment of LEED vs. Conventionally Built Residential Units*. AFIT/GEM/ENV/11-M09. Faculty Advisor: Lt Col Peter P. Feng. Sponsor: N/A.
- COTTLE, ANDREW E., *Initial Operational Validation of an Unmanned Aerial Vehicle Mission Simulation Model*. AFIT/GSE/ENV/11-M08. Faculty Advisor: Dr. David R. Jacques. Sponsor: AFRL/RB.
- CURTIS, CHRISTOPHER K., *Improvements to Multiple Remotely Piloted Aircraft Surveillance Capabilities with Cooperative Ground Moving Target Indicator Assistance*. AFIT/GRD/ENV/11-J01. Faculty Advisor: Dr. John M. Colombi. Sponsor: AFRL/RX.
- DARVILL, WHITICAR S., *Virtualness of the Cost Estimating Community*. AFIT/GCA/ENV/11-M01. Faculty Advisor: Lt Col Eric J. Unger. Sponsor: OSD.
- ENRIGHT, THOMAS E., JR., *An Analysis of How Education, Age, Overseas Assignments, and Mavenism Impact Use of New Media Technology*. AFT/GIR/ENV/11-D01. Faculty Advisor: Dr. Alan R. Heminger. Sponsor: N/A.
- EVEY, CHRISTOPHER J., *Analysis of Scaling in a Service-Oriented High Performance Computing (HPC) Environment*. AFIT/GSE/ENV/11-J03DL. Faculty Advisor: Dr. John M. Colombi. Sponsor: N/A.

- GANNON, TIMOTHY W., *Understanding Schedule Forecasting Shortfalls in Federal Design-Build Facility Procurement*. AFIT/GEM/ENV/11-M02. Faculty Advisor: Lt Col Peter P. Feng. Sponsor: N/A.
- GETZELMAN, ELLEN M., *An Analysis of Optimal Fuel Tankering in the C-17 Globemaster III to Address Differential Fuel Prices*. AFIT/GSE/ENV/11-S03DL. Faculty Advisor: Dr. John M. Colombi. Sponsor: AMC.
- GKOUTOULOUDIS, MICHAIL, *Smoking in the United States Air Force: Trends, Most Prevalent Diseases and Their Association with Cost*. AFIT/GCA/ENV/11-S02. Faculty Advisor: Lt Col Dirk P. Yamamoto. Sponsor: AFMC.
- HAEUSER, MATTHEW A. & MAHAR, BRIAN J., *The Effect of Small Unmanned Aerial Vehicle Presence on Competing Layered Sensing Architectures*. AFIT/GSE/ENV/11-M06. Faculty Advisor: Dr. David R. Jacques. Sponsor: AFRL/RV.
- HALVORSON, ELIAS J., *A Century Long Pursuit Of Alternative Fuels and Feedstocks: A Content Analysis*. AFIT/GFA/ENV/11-M01. Faculty Advisor: Dr. Charles A. Bleckmann. Sponsor: AFRL/RZ.
- HICKS, JOSEPH L., *New Media Analysis: The Effects of Peer Influence and Personality Characteristics through the Stages of Trial, Adoption, and Continued Use of Video Sharing Websites*. AFIT/GIR/ENV/11-M02. Faculty Advisor: Dr. Michael R. Grimaila. Sponsor: 711 HPW/RH.
- HO, DAVID M., *Personality and Social Influence Characteristic Affects on Ease of Use and Peer Influence of New Media Users Over Time*. AFIT/GRD/ENV/11-M01. Faculty Advisor: Dr. Alfred E. Thal. Sponsor: 711 HPW/RH.
- HOLDER, CRAIG A., *Development of Optimized Guidelines for Therapeutic Strategies for Organophosphate Poisoning*. AFIT/GIH/ENV/11-M02. Faculty Advisor: Dr. Michael L. Shelley. Sponsor: 711 HPW/RH.
- HOMAN, JEREMY & SCHARCH, MATTHEWS, *Application and Validation of Concept Maturity Assessment Framework*. AFIT/GSE/ENV/11-M05. Faculty Advisor: Dr. David R. Jacques. Sponsor: N/A.
- HOWARD, JOHN K., See BOHREN, JAMES S.
- JOHNSON, TRAVIS R., *Application of Relational Contracting Methods to Federal Construction Projects*. AFIT/GEM/ENV/11-M03. Faculty Advisor: Lt Col Peter P. Feng. Sponsor: N/A.
- KEATON, CHARLES F., *Real-Time Problem Detection in Acquisition Contracts*. AFIT/GCA/ENC/11-01. Faculty Advisor: Dr. Edward D. White. Sponsor: OSD.
- KESISIKLIS, ILIAS, *Major Cost Drivers of MVCs Cost Involving Air Force Personnel and the Influence of the Military Environment*. AFIT/GCA/ENV/11-S01. Faculty Advisor: Lt Col Dirk P. Yamamoto. Sponsor: AFSC.
- KILLALY, MICHAEL S., *I Can, but I Won't: An Exploratory Study on People and New Information Technologies in the Military*. AFIT/GIR/ENV/11-M03. Faculty Advisor: Lt Col Gregory M. Schechtman. Sponsor: OSD.
- LA TOUR, PAUL A., *Integrate-Modify-Create: Applying Multi-Criteria Decision Analysis to Rapid Prototyping*. AFIT/GSE/ENV/11-M07. Faculty Advisor: Dr. John M. Colombi. Sponsor: AFRL/RV.
- LAMBERT, DANIEL B., *Composite Aircraft Life Cycle Cost Estimating Model*. AFIT/GCA/ENV/11-M02. Faculty Advisor: Dr. Som R. Soni. Sponsor: AFRL/RB.

- LEACH, DAVID A. & SEARLE, CHAD T., *Enterprise Requirements and Acquisition Model*. AFIT/ISE/ENV/11-J01. Faculty Advisor: Lt Col Joseph R. Wirthlin. Sponsor: SMC.
- LITTLE, SAMUEL A., SCHREINER, ROBERT J., & SPENCER, GUY T., *Capability Based Assessment for the Chromotomographic Spectrometer Flight Experiment*. AFIT/ISE/ENV/11-J03. Faculty Advisor: Dr. Jonathan T. Black. Sponsor: N/A.
- LOZANO, BENAIHA D., *Improving Unmanned Aircraft Persistence by Enhancing Endurance and Effective Surveillance Using Design of Experiments and Regression Analysis*. AFIT/GSE/ENV/11-M09. Faculty Advisor: Dr. John M. Colombi. Sponsor: AFRL/RB.
- MAHAR, BRIAN J., See HAEUSER, MATTHEW A.
- MARTINEZ, JACOB A., *Soft Systems Methodology Applied to the Joint Information Operation Warfare Center (JIOWC) Organization*. AFIT/GSE/ENV/10-D03DL. Faculty Advisor: Dr. John M. Colombi. Sponsor: JIOWC.
- MCGROGAN, JASON D. & SCHNEIDER, MICHAEL F., *Architecture Based Workload Analysis of UAS Multi-Aircraft Control: Implications of Implementation on MQ-1B Predator*. AFIT/GSE/ENV/11-M02. Faculty Advisor: Dr. John M. Colombi. Sponsor: ASC.
- MINITER, JEREMY M., *Modeling Enhanced Storage of Groundwater Contaminants Due to the Presence of Cracks in Low Permeability Zones Underlying Contaminant Source Areas*. AFIT/GES/ENV/11-M02. Faculty Advisor: Dr. Mark N. Goltz. Sponsor: SERDP.
- MONFETTE, MONICA L., *Impact of Snow Removal Operations on Thermoplastic Pavement Markings*. AFIT/GEM/ENV/11-M08. Faculty Advisor: Lt Col William E. Sitzabee. Sponsor: N/A.
- MORIN, ERIC C., *The Application of Cost Estimation to the Compatibility Assessment Method*. AFIT/GFA/ENV/11-M02. Faculty Advisor: Dr. Charles A. Bleckmann. Sponsor: ASC.
- MULL, DALE M., *Paint Pavement Marking Performance Prediction Model that Includes the Impacts of Snow Removal Operations*. AFIT/GEM/ENV/11-M04. Faculty Advisor: Lt Col William E. Sitzabee. Sponsor: NC DOT.
- MURPHY, RACHEAL G., *A Primary Care Workload Production Model for Estimating Relative Value Unit Output*. AFIT/GFA/ENV/11-M03. Faculty Advisor: Dr. Alfred E. Thal. Sponsor: 88 MDSS.
- NEEDHAM, JONATHAN D., *Degradation Modeling of Polyurea Pavement Markings*. AFIT/GEM/ENV/11-M05. Faculty Advisor: Lt Col William E. Sitzabee. Sponsor: NC DOT.
- NUHU, ABDUL-RAZAK, See AMIRAULT, PHILIP.
- PAULI, AARON, *Leadership Criteria under Maximum Performance Conditions*. AFIT/GRD/ENV/11-M02. Faculty Advisor: Lt Col Joseph R. Wirthlin. Sponsor: 711 HPW/RH.
- PETERS, KENNETH G., *Global Strike Trajectory Optimization and Mission Planning Tool: A Systems Engineering Analysis*. AFIT/GSE/ENV/11-M01. Faculty Advisor: Dr. David R. Jacques. Sponsor: AFRL/RZ.
- PETERSON, CHRISTY L., *Measuring the Utility of a Cyber Incident Mission Impact Assessment (CIMIA) Process for Mission Assurance*. AFIT/GIR/ENV/11-M04. Faculty Advisor: Dr. Michael R. Grimaila. Sponsor: 711 HPW/RH.

PHIPPS, SHAUN D. & WAGENBACH, PHILLIP F., *Human Systems Integration in Satellite Command & Control Systems: Lessons Learned from Multi-Mission Satellite Operations Center Ground System Architecture*. AFIT/GSE/ENV/11-S06DL. Faculty Advisor: Dr. John M. Colombi. Sponsor: SMC.

RICHEY, MARK B., *The Positive Impact of Negative Feedback*. AFIT/GRD/ENV/11-M03. Faculty Advisor: Lt Col John J. Elshaw. Sponsor: 711 HPW/RH.

RINKER, JOHN P., *Retrospective Geospatial Modeling of PM10 Exposures from Open Burning at Joint Base Balad, Iraq*. AFIT/GIH/ENV/11-M03. Faculty Advisor: Lt Col Dirk P. Yamamoto. Sponsor: 711 HPW/USAFSAM.

ROEN, DAVID T., *Modeling Vertical Flow Treatment Wetland Hydraulics to Optimize Treatment Efficiency*. AFIT/GES/ENV/11-M03. Faculty Advisor: Dr. Mark N. Goltz. Sponsor: AFCEE.

ROYALS, JASON P., *Avatars, Media Usage, and the Linkages to E-learning Effectiveness*. AFIT/GIR/ENV/11-M05. Faculty Advisor: Lt Col Gregory M. Schechtman. Sponsor: N/A.

SCHARCH, MATTHEWS, See HOMAN, JEREMY.

SCHNEIDER, MICHAEL F., See MCGROGAN, JASON D.

SCHREINER, ROBERT J., See LITTLE, SAMUEL A.

SEARLE, CHAD T., See LEACH, DAVID A.

SHIN, HYOUNGJIN, See BECKETT, EDWARD.

SHIBATA, JASON T., *A Space Acquisition Leading Indicator Based On System Interoperation Maturity*. AFIT/GSE/ENV/10-D02DL. Faculty Advisor: Dr. John M. Colombi. Sponsor: SMC.

SNYDER, ERIC B., *Conceptual Design and Analysis of Service Oriented Architecture (SOA) for Command and Control of Space Assets*. AFIT/GSE/ENV/10-D04DL. Faculty Advisor: Dr. John M. Colombi. Sponsor: SMC.

SPENCER, GUY T., See LITTLE, SAMUEL A.

SURAJBALLY, KRISHNA R., *Risks Associated with Federal Construction Projects*. AFIT/GEM/ENV/11-J01. Faculty Advisor: Lt Col Peter P. Feng. Sponsor: AFCEE.

WAGENBACH, PHILLIP F., See PHIPPS, SHAUN D.

WINKLER, HANS U., *Optimization of Manpower Utilizing Empirical Data for Enduring Civil Engineering Operation's Flight at Al Udeid Air Base, Qatar*. AFIT/GEM/ENV/11-M07. Faculty Advisor: Lt Col William E. Sitzabee. Sponsor: AFCESA.

WOSKOV, STEPHEN M., *Improving the Relevance of Cyber Incident Notification for Mission Assurance*. AFIT/GIR/ENV/11-M06. Faculty Advisor: Dr. Michael R. Grimaila. Sponsor: 711 HPW/USAFSAM.

YON, RICHARD E., *Characterization of Graphite Composite Material Particulates from USAF Aircraft Maintenance Operations*. AFIT/GIH/ENV/11-M04. Faculty Advisor: Lt Col Dirk P. Yamamoto. Sponsor: 711 HPW/USAFSAM.

5.6.2. GRADUATE RESEARCH PAPERS

BECKER, JAMES A. & VETTER, SHANE M., *Analysis of Capability and Design Flexibility*. AFIT/ISE/ENV/11-J02. Faculty Advisor: Dr. David R. Jacques. Sponsor: OSD.

KRETSINGER, CHRISTOPHER D. & VARILEK, JOHN D., *High Velocity Penetrating Weapon Early Systems Engineering Study*. AFIT/ISE/ENV/11-J04. Faculty Advisor: Dr. John M. Colombi. Sponsor: AFRL/RW.

MORISSETTE, GREGORY A., *Developing a Predictive Model for Facility Repair Costs on United States Air Force Installations*. AFIT/ILS/ENV/11J-01. Faculty Advisor: Dr. Alfred E. Thal. Sponsor: HQ USAF/A7. [COA]

OLSEN, SUSAN R., *Mission Assurance Analysis of Theater Ballistic Missile Defense Systems (TBMDs)*. AFIT/ISE/ENV/11-S01. Faculty Advisor: Dr. Michael R. Grimaila. Sponsor: USSTRATCOM.

VARILEK, JOHN D., See KRETSINGER, CHRISTOPHER D.

VETTER, SHANE M., See BECKER, JAMES A.

5.6.3. 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 & 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

SPONSOR FUNDED RESEARCH PROJECTS

"Composite Materials and Technology Airframe Cost Comparison." Sponsor: AFRL/RB. Funding: \$20,000.

"System Engineering Efficiency Research." Sponsor: SAF. Funding: \$55,000 – Badiru 25%, Wirthlin 25%, Sitzabee 25%, Thal 25%.

REFEREED JOURNAL PUBLICATIONS

Grimaila, Michael and A. B. Badiru, "A Hybrid Dynamic Decision Making Methodology for Defensive Information Technology Contingency Measure Selection in the Presence of Cyber Threats," Operational Research: An International Journal, Vol. 10, No. 3, Jan 2011, pp. 1-22.

Teresa Wu, Som Soni, Mengqi Hu, Fan Li and A. Badiru, "The application of Memetic Algorithms for Forearm Crutch Design: A Case Study," Mathematical Problems in Engineering, Vol. 2011, Paper ID 162580, pp. 1-14.

Omitaomu, O. A., MK Jeong, and A. B. Badiru, "Online Support Vector Regression With Varying Parameters for Time-Dependent Data," IEEE Transactions on Systems, Man, and Cybernetics – Part A: Systems and Humans, Vol. 41, No. 1, Jan 2011, pp. 191-197.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Wu, Teresa; Som R. Soni, and A. B. Badiru, "Applying Memetic Algorithm to Design Forearm Crutch," presented at Structural Longevity Forum, Orlando, Florida, July 26, 2011.

Badiru, A. B., Wellington Award Inaugural Lecture:- "Pareto Distribution Revisited: National Wealth Creation and Distribution in an Era of Globalization," presented at Industrial Engineering Research Conference, Reno, Nevada, May 22, 2011.

Badiru, A. B. and M. N. Goltz, "Holistic Systems Approach to Sustainability: Bridging Environmental and Social Dimensions," in Proceedings of Industrial Engineering Research Conference, Reno, Nevada, May 22-25, 2011.

BOOKS AND CHAPTERS IN BOOKS

Badiru, A. B. and O. A. Omitaomu (2011), Handbook of Industrial Engineering Equations, Formulas, and Calculations, Taylor & Francis CRC Press, Boca Raton, FL, 2011.

Badiru, A. B. (2011), "Introduction to Half-Life Theory of Learning Curves," Book Chapter n Jaber, M. editor, Learning Curves: Theory, Models, and Applications, CRC Press, Boca Raton, FL, pp. 129-161.

Badiru, A. B. (2011), "Industrial Work Measurement through Multivariate Learning Curves" Book Chapter in Jaber, M. editor, Learning Curves: Theory, Models, and Applications, CRC Press, Boca Raton, FL, pp. 349-366.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Accreditation program reviewer for ABET, 2011.

Badiru, A. B., Invited Discussant on International Research Collaboration, World Academy of Science, Engineering, and Technology (WASET 2011), Paris, France, Aug 23-26, 2011.

Badiru, A. B., Invited Graduation Lecture, "Advancements in Energy Technology: Implications for UAV Design and Development," Nigeria Air Force Institute of Technology, Kaduna, Nigeria, July 29, 2011.

Badiru, A. B., Wellington Award Inaugural Lecture, "Pareto Distribution Revisited," IIE Annual Conference, Reno, Nevada, May 22, 2011.

BLECKMANN, CHARLES A.,

Professor Emeritus of Environmental Management, Department of Systems and Engineering Management, AFIT Appointment Date: 1993 (AFIT/ENV); BA, Secondary Education (Biology), University of Evansville, 1967; MS, Biology, Incarnate Word College, 1971; PhD, Botany, University of Arizona, 1977. Dr. Bleckmann's research interests include water and wastewater analyses and treatment, land treatment of wastes, groundwater remediation, biodegradation of organics, fuels microbiology, and bioweapons. Tel. 937-255-3636 x4721 (DSN 785-3636 x4721), email: Charles.Bleckmann@afit.edu

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

SPONSOR FUNDED RESEARCH PROJECTS

"Expedited Systems Engineering (SE) for Rapid Capability and Urgent Needs." Sponsor: SAF. Funding: \$100,000 – Colombi 50%, Jacques 30%, Wirthlin 20%.

"An Advanced Computational Approach to System of Systems Analysis & Architecting using Agent-based Behavioral Modeling." Sponsor: OSD. Funding: \$40,000 – Colombi 85%, Wirthlin 15%.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Jason McGrogan, Michael Schneider, Robb Wirthlin, John Colombi, and Michael Miller, Using Discrete Event Simulation for Manpower Estimates of Semiautonomous Systems, Proceedings of the Conference on Systems Engineering Research, Redondo Beach, CA, April 2011.

Erin T. Ryan; David R. Jacques; John M. Colombi, A More Flexible Approach to Valuing Flexibility, Proceeding of INCOSE International Symposium, Denver, CO. July 2011.

Vhance V. Valencia, John M. Colombi, Alfred E. Thal, Jr., and William E. Sitzabee, Asset Management: A Systems Perspective, Proceedings of the 2011 Industrial Engineering Research Conference, T. Doolen and E. Van Aken, eds, Reno Nevada, May 2011.

D.J. Jacques, J. M. Colombi, R.G. Cobb, Fostering Systems Engineering Education Through Interdisciplinary Programs and Graduate Capstone Projects, American Society for Engineering Education (ASEE) 118th Annual Conference, Vancouver, BC, Canada June 26 - 29, 2011.

Michael Schneider, Jason McGrogan, John Colombi, Michael Miller and David Long, Modeling Pilot Workload for Multi-Aircraft Control of an Unmanned Aircraft System, Proceeding of INCOSE International Symposium, Denver, CO. June 2011.

Michael Schneider, Jason McGrogan, J. Robert Wirthlin, John Colombi and Michael Miller, Predicting the Impact of Multi-Aircraft Control on UAS Operations, Proceedings of the 2011 Industrial Engineering Research Conference, T. Doolen and E. Van Aken, eds, Reno Nevada, May 2011.

Erin T. Ryan, David R. Jacques and John M. Colombi, Defining Flexibility and Flexibility-Related Terminology for DOD Programs, Proceedings of the Conference on Systems Engineering Research, Redondo Beach, CA, April 2011.

Vinod D. Naga, John Colombi, Ken Hopkinson and Michael Grimala, A Method to Determine Superior QoS Configurations for Mission Objectives: Aligning the Network with the Mission, Special Track on Mission Assurance and Critical Infrastructure Protection (STMICIP'11) at the 2011 World Congress in Computer Science, Computer Engineering, and Applied Computing, July 2011.

Jason Shibata and John Colombi, A Space Acquisition Leading Indicator Based on System Interoperation Maturity. Proceedings of the Conference on Systems Engineering Research, Redondo Beach, CA, April 2011.

Paul A. La Tour, John M. Colombi, and J. Robert Wirthlin, Integrate-Modify-Create: Applying Multi-Criteria Decision Analysis to Rapid Prototyping. Proceedings of the Conference on Systems Engineering Research, Redondo Beach, CA, April 2011.

BOOKS AND CHAPTERS IN BOOKS

Charles Garland and John Colombi. Systems Engineering Case Studies, In *Systems Engineering Tools and Methods for Engineers*. Edited by Ali K Kamrani and Maryam Azimi. CRC Press Pub Date: December 2010. ISBN 978-1-4398092-6-6.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Systems Engineering Track Co-Chair, Industrial Engineering Research Conference (IERC) May 2011.

ELSHAW, J. JOHN, Lt Col,

Assistant Professor of Management; BS, Accounting, University of Akron, 1991; MBA, Regis University, 1996, PhD, Krannert School of Management, Purdue University, 2010. Lt Col Elshaw's research interests include organizational behavior, trust, leadership, human resource management, organizational causes of high-consequence errors, technology impact on individual and group behavior, social network analysis, cognition and emotions, organizational climate and culture, psychological influences on foreign audiences, cross-cultural leadership and communication, and hierarchical linear modeling. Tel. 937-255-3636 x4574 (DSN 785-3636 x4574), email: John.Elshaw@afit.edu

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

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. Maj Feng's research interests include Lean Theory and its application to facility design and construction, contingency construction management, construction management, decision analysis, sustainability, life cycle assessment, and discrete event simulation. Tel. 937-255-3636 x4648 (DSN 785-3636 x4648), email: Peter.Feng@afit.edu

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. Dr 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

REFEREED JOURNAL PUBLICATIONS

Gibb, R. W., Ercoline, B., & Scharff, L. (2011). Spatial Disorientation: Decades of pilot fatalities. *Aviation, Space, and Environmental Medicine*, 82, 717-724.

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

SPONSOR FUNDED RESEARCH PROJECTS

“Fate and Transport of Nanosilver in Groundwater.” Sponsor: AFMSA. Funding: \$70,370 – Goltz 10%, Racz 10%, Kanel 80%.

“Development of a Novel Sustainable Energy-Efficient Nanotechnology for Water Treatment.” Sponsor: AFOSR. Funding: \$27,685.

“Hydrogeophysical Impact of Clay-DNAPL Interactions on Storage of Chlorinated Solvents in Low Permeability Zones.” Sponsor: SERDP. Funding: \$38,547.

GRMAILA, MICHAEL R.,

Associate Professor of Systems Engineering, AFIT Appointment Date: 2004 (AFIT/ENV); Center for Cyberspace Research (CCR), BS, Texas A&M University, 1993; MS, Texas A&M University, 1995; PhD, Texas A&M University, 1999. Dr. Grmaila's research interests include communications security, computer and network security, data mining, information assurance, and information warfare. Tel. 937-255-3636 x4800 (DSN 785-3636 x4800), email: Michael.Grimaila@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

“Communication Channel Security.” Sponsor: LTS. Funding: \$200,000 – Grmaila 50%, Humphries 50%. [CCR]

REFEREED JOURNAL PUBLICATIONS

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. PP(99), June 2011, pp. 1-28.

Mills, R.F., Grimaila, M.R., Peterson, G., and Butts, J., "A Scenario-Based Approach to Mitigating the Insider Threat," *The Information System Security Association (ISSA) Journal*, May 2011, pp. 12-19.

Choobineh, J., Anderson, E.A., Fazen, M., and Grimaila, M.R., "Assessment of Mission Risk: Role of Protection of Information and Communication Technology Resources," *Journal of Information Warfare*, 10:1, April 2011, pp. 1-17.

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, pp. 1-23, March 2011.

Grimaila, M.R. and Badiru, A., "A Hybrid Dynamic Decision Making Methodology for Defensive Information Technology Contingency Measure Selection in the Presence of Cyber Threats," *Operational Research*, Springer, DOI: 10.1007/s12351-010-0102-2, Vol. 10, No. 3, pp. 1-22, January 2011.

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

Naga, V., Colombi, J., Grimaila, M.R., and Hopkinson, K., "A Method to Determine Superior QoS Configurations for Mission Objectives: Aligning the Network with the Mission" Proceedings of the 2011 International Conference on Security and Management (SAM11), Las Vegas, Nevada, July 18-21, 2011.

Peterson, C., Grimaila, M.R., Mills, R.F., Haas M.W., Thomas, G., and Kelly, D., "Measuring the Utility of a Cyber Incident Mission Impact Assessment (CIMIA) Notification Process," Proceedings of the 2011 International Conference on Security and Management (SAM11), Las Vegas, Nevada, July 18-21, 2011.

Abercrombie, R.K., Ferragut, E., Sheldon, F.T., and Grimaila, M.R., "Addressing the Need for Independence in the CSE Model," Proceedings of the 2011 IEEE Symposium on Computational Intelligence in Cyber Security (CICS 2011), Paris, France, April 11-15, 2011.

Woskov, S. Grimaila, M.R., Mills, R.F., and Haas M.W., "Design Consideration for a Case-Based Reasoning Engine for Scenario-Based Cyber Incident Notification," Proceedings of the 2011 IEEE Symposium on Computational Intelligence in Cyber Security (CICS 2011), Paris, France, April 11-15, 2011.

Miller, J., Mills, R.F., Grimaila, M.R., and Haas M.W., "A Scalable Architecture for Improving the Timeliness and Relevance of Cyber Incident Notifications," Proceedings of the 2011 IEEE Symposium on Computational Intelligence in Cyber Security (CICS 2011), Paris, France, April 11-15, 2011.

Carvalho, M., Perez, C., Dasgupta, D. and Grimaila, M.R., "Mission Resilience in Cloud Computing: A Biologically Inspired Approach, Proceedings of the 2011 International Conference on Information Warfare and Security (ICIW 2011), Washington, D.C., March 17-18, 2011.

BOOKS AND CHAPTERS IN BOOKS

Hass, M., Mills, R.F., and Grimaila, M.R., "Aiding Understanding of a Contested Information Environment's Effect on Operations," *Human-in-the-Loop Simulations - Methods and Practice*, L. Rothrock and S. Narayanan, S. (Eds.), ISBN 978-0-85729-882-9, 2011.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Fellow of the Information System Security Association (ISSA).

Editorial Board – Information System Security Association (ISSA) Journal.

Referee for Journal of Defense Modeling and Simulation.

Referee for Journal of Network and Systems Management.

Conference Committee Member for 10th European Conference on Information Warfare and Security (ECIW 2011).

Conference Committee Member for 2011 International Conference on Security and Management (SAM11).

Conference Committee Member for 2011 NATO Cooperative Cyber Defence Centre of Excellence (CCD COE) International Conference on Cyber Conflict.

Conference Committee Member for 6th International Conference on Information Warfare and Security (ICIW 2011).

Conference Committee Member for 2011 IEEE Symposium on Computational Intelligence in Cyber Security (CICS 2011).

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

JACQUES, DAVID R.,

Associate Professor of Aerospace Engineering, Department of Systems and Engineering Management, AFIT. Appointment Date: 1999 (AFIT/ENV); BS, Mechanical Engineering, Lehigh University, 1983; MS, Aeronautical Engineering, AFIT, 1989; PhD, Aeronautical Engineering, AFIT, 1995. Dr. Jacques' research interests include development planning, architecture based evaluation, multi-objective or constrained optimal design, and cooperative behavior and control of autonomous vehicles. Tel. 937-255-3636 x3329 (DSN 785-3636 x3329), email: David.Jacques@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

“High Velocity Penetrating Weapon Concept Exploration.” Sponsor: AFRL/RW. Funding: \$40,000 – Jacques 50%, Colombi 50%.

“Valuing Flexibility in Design.” Sponsor: OSD. Funding: \$31,100 – Jacques 50%, Colombi 50%.

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

LADD, DARIN A., Lt Col,

Assistant Professor of Information Resource Management, Department of Systems and Engineering Management, AFIT Appointment Date: 2010 (AFIT/ENV); BS, Humanities, United States Air Force Academy, 1996; MS, Information Resource Management, Air Force Institute of Technology, 2002; PhD, Management Information Systems, Washington State University, 2010. Maj Ladd's research interests include Strategic Decision Support, Public Entrepreneurship, Mobile Computing, and Research Methods. Tel. 937-255-3636 x3323 (DSN 785-3636 x3323), email: Darin.Ladd@afit.edu

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Ladd, D.A., Organizational Culture and Knowledge Transfer: Separating Professional Association From Unit-level Effects Using HLM, 44th Hawaii International Conference on System Sciences, Jan 2011.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Reviewer, Information Systems Journal, European Journal of Information Systems, International Conference on Information Systems, Decision Sciences Institute Conference, Journal of Organizational Computing and Electronic Commerce.

Graduate, Cyber X, Cyber 300.

LANGHALS, BRENT T., Lt Col,

Assistant Professor of Engineering Systems, Department of Systems and Engineering Management, AFIT Appointment Date: 2011 (AFIT/ENV); BS, History, United State Air Force Academy, 1995; MS, Information Resource Management, Air Force Institute of Technology, 2001; PhD, Management Information Systems, University of Arizona, 2011. Lt Col Langhals' research interests include vigilance, human-system integration, deception/intent detection. Tel 937-255-3636 x4352 (DSN 785-3636 x4352), email: Brent.Langhals@afit.edu

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

MILLER, MICHAEL E.,

Assistant Professor of Systems Integration, Department of Systems and Engineering Management, AFIT Appointment Date: 2010 (AFIT/ENV); BS, Industrial and Systems Engineering, Ohio University, 1987; MS, Industrial and Systems Engineering, Ohio University, 1989; PhD, Industrial and Systems Engineering, Virginia Polytechnic and State University, 1993. Dr. Miller specializes in Human Factors and Systems Engineering, specifically visual perception, visual display design, and human –system interaction. Tel. 937-255-3636 x4651 (DSN 785-3636 x4651), email: Michael.Miller@afit.edu

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Miller, M.E. and Gilman, J. (2011) Daylight-Matched Lighting for Mixed Illumination Environments, Illuminating Engineering Society Proceedings, San Antonio, TX.

Schneider, M., McGrogan, J., Colombi, J., Miller, M. and Long D. (2011). Modeling Pilot Workload for Multi-Aircraft Control of an Unmanned Aircraft System, INCOSE International Workshop, Denver, CO.

McGrogan, J., Schneider, M., Wirthlin, R., Colombi, J., and Miller, M. (2011). Predicting the Impact of Multi-Aircraft Control on UAS Operations, Industrial Engineering Research Conference, Reno, NV.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

McGrogan, J., Schneider, M., Wirthlin, R., Colombi, J. and Miller, M. (2011). Using Discrete Event Simulation for Manpower Estimates of Semiautonomous Systems, Proceedings of the Conference on Systems Engineering Research, Redondo Beach.

PATENTS

Cok, R.S. and Miller, M.E. (2011). LED device having improved light output. United States Patent 7,948,172.

Miller, M.E., Hamilton, J.F. and Arnold, A.D. (2011). Passive matrix electro-luminescent display system. United States Patent 7,940,236.

Miller, M.E., Murdoch, M.J. and Hamer, J.W. (2011) Electro-luminescent display with power line voltage compensation. United States Patent 7,872,619.

MUCZYK, JAN P.,

Professor Emeritus of Management, Department of Systems and Engineering Management, AFIT Appointment Date: 1995 (AFIT/ENV). BS, MBA, and DBA, University of Maryland in Management and Organizational Behavior. Dr. Muczyk's research interests include leadership, streamlining bureaucracies, and strategy implementation.

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

REFEREED JOURNAL PUBLICATIONS

Datta, Tania, Racz, LeeAnn, Kotay, Shireen M., and Goel, Ramesh, Seasonal Variations of Nitrifying Community in Trickling Filter-Solids Contact (TF/SC) Activated Sludge Systems, Bioresource Technology, 102(3):2272-2279, 2011.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Racz, LeeAnn. and Goel, Ramesh K., Fate of Selected Estrogens in Two Laboratory Scale Sequencing Batch Reactors Fed With Different Organic Carbon Sources, WEFTEC 2010 Proceedings, New Orleans, LA, October 2010.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Kanel, Sushil R., Goltz, Mark N. and Racz, LeeAnn, Transport of Engineered Nanosilver Particles in Saturated Porous Media, 241st ACS National Meeting, Anaheim, CA, March 2011.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Goltz, Mark N., Kim, Dong-Shik., and Racz, LeeAnn, Using Nanotechnology to Detect Nerve Agents, *Air and Space Power Journal*, 25(2):56-60, 2011.

RITSCHER, JONATHAN D., Maj,

Assistant Professor of Cost Analysis, Department of Systems and Engineering Management, AFIT
Appointment Date: 2001 (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. Maj 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

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

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Racz, LeeAnn. and Goel, Ramesh K., Fate of Selected Estrogens in Two Laboratory Scale Sequencing Batch Reactors Fed With Different Organic Carbon Sources, WEFTEC 2010 Proceedings, New Orleans, LA, October 2010.

Hasty, B., Schechtman, G., and Killaly, M. "Cloud Computing: Differences in Public and Private Sector Concerns," Proceedings of the Academic Business World International Conference (ABWIC), May 2011.

Hasty, B., Schechtman, G. "Beyond the GRE for Non-Traditional Applicants to Graduate Schools," Proceedings of the International Conference on Learning and Administration in Higher Education, May 2011.

Royals, J, Barelka, A, and Schechtman G, "Avatars, Media Usage, and the Linkages to E-learning Effectiveness" Proceedings of the Interservice/Industry Training, Simulation, and Education Conference (ITSEC) 2011.

SHELLEY, MICHAEL L.,

Professor of Environmental Science and Engineering, Department of Systems and Engineering Management, AFIT Appointment Date: 1996 (AFIT/ENV); BCE (Civil Engineering), Auburn University, 1974; MS (Environmental Engineering), Virginia Tech, 1975; PhD, Environmental Science and Engineering, University of North Carolina, 1985. Dr. Shelley focuses on system dynamics modeling in analyzing long-term management strategies. His research interests include abiotic and biochemical contaminant fate and transport, physiologically-based pharmacokinetic modeling, and ecological engineering design to optimize mission activity with environmental constraints. Tel. 937-255-3636 x7387 (DSN 785-3636 x7387), email: Michael.Shelley@afit.edu

SITZABEE, WILLIAM, E., Lt Col,

Assistant Professor, Department of Systems and Engineering Management, AFIT Appointment Date: Jun 2009 (AFIT/ENV); BS, Civil Engineering, Norwich University, VT, 1993; MS, Engineering Management, Air Force Institute of Technology, Wright-Patterson AFB, OH, Mar 2004; Ph.D., Civil Engineering, North Carolina State University, NC, 2008. Lt Col Sitzabee's research interests include construction management, transportation asset management, geographical information systems, facility and infrastructure operations. Tel. 937-255-3636 x7395 (DSN 785-3636 x7395), email: William.Sitzabee@afit.edu

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Schiff, Z. and Sitzabee, W., “A Spatial Risk Analysis of Oil Refineries within the United States.” The 2011 International Conference on Security and Management, Las Vegas, Nevada, July 2011.

Surajbally, K., Feng, P., Sitzabee, W and Suermann, P. “Mission Assurance Implications for Federal Construction.” The 2011 International Conference on Security and Management, Las Vegas, Nevada, July 2011.

Sitzabee, W., Feng, P., and Sturtevant, M., “Intelligent Transportation Systems and Asset Management.” The 7th Annual Inter-University Symposium on Infrastructure Management, Chicago IL, June 2011.

Johnson, T., Sitzabee, W., and Feng, P., “Evolution of Relational Contracting in Construction: Project Delivery Methods Beyond Partnering.” Annual International Command and Control Research and Technology Symposium (ICCRST), June 2011.

Pluger, M., Feng, P., Holt, D., and Sitzabee, W., “Management Analysis of Civil-Military Construction in Iraq and Afghanistan.” Annual International Command and Control Research and Technology Symposium (ICCRST), June 2011.

Valencia, V., Colombi, J., Thal, A., and Sitzabee, W. “Asset Management: A Systems Perspective.” Institute of Industrial Engineers National Conference, June 2011.

Winkler, H. & Sitzabee, W. “Manpower Optimization of USAF Facility and Infrastructure Support Requirements at Semi-Permanent Base.” Western Decision Science Institute, April 2011.

SONI, SOM R.,

Associate Professor of Systems Engineering, BS (Hons), Punjab University, 1967; MS, University of Roorkee (renamed as IIT Roorkee) India, 1969; PhD, University of Roorkee (renamed as IIT Roorkee) India, 1972. Teaching and research related to systems engineering design, analytical and experimental mechanics of composite materials and structures. Tel. 937-255-3355 x 3420 (DSN 785-3355 x 3420), email: Som.Soni@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

“Composite Materials and Technology Airframe Cost Comparison.” Sponsor: AFRL/RB. Funding: \$20,000.

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

SPONSOR FUNDED RESEARCH PROJECTS

“Effectiveness of the International Military Education and Training (IMET) Program.” Sponsor: DISAM. Funding: \$25,016.

UNGER, ERIC J., Lt Col,

Assistant Professor, Department of Systems and Engineering Management, AFIT Appointment Date: 2007 (AFIT/ENV); BA, Mathematics and Economics, Northwestern University, IL 1990; MS, Acquisition Management, Air Force Institute of Technology, Wright-Patterson AFB, OH, 2001; Ph.D., Policy Analysis, Pardee RAND Graduate School, CA, 2007. Lt Col Unger’s research interests include econometric analysis of financial data, operations and maintenance (O&M) and operations and support (O&S) costs analysis, research

and development cost estimation, and cost per flying hour analysis. Tel. 937-255-3636 x7402 (DSN 785-3636 x7402), email: Eric.Unger@afit.edu

SPONSOR FUNDED EDUCATIONAL PROJECTS

“Cost Engineering/Analysis Program Development.” Sponsor: NAVSEA. Funding: \$267,000 – Unger 50%, Thal 50%.

WIRTHLIN, JOSEPH R., Lt Col,

Assistant Professor, Department of Systems and Engineering Management, AFIT Appointment Date: 2009 (AFIT/ENV); BA, Engineering Sciences, The United States Air Force Academy, CO 1994; MS, Engineering and Management, Massachusetts Institute of Technology, MA 2000; Ph.D., Engineering Systems, Massachusetts Institute of Technology, MA, 2009. Lt Col Wirthlin's research interests include weapon system acquisition management, research and development management, risk management, product development, lean six sigma, rapid product development, new product development, and systems engineering. Tel: 937-255-3636 x4650 (DSN 785-3636 x4650), email: Joseph.Wirthlin@afit.edu

SPONSOR FUNDED RESEARCH PROJECTS

“Enterprise Acquisition Modeling and Analysis.” Sponsor: SMC. Funding: \$50,000.

“Research and Development, Engineering and Acquisition Modeling and Analysis.” Sponsor: SMC. Funding: \$50,000.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Leach, D., Searle, C., Wirthlin, J., Houston, D., Acheson, P., (2011) Developing Simulator Support for Space Acquisitions, *Proceedings of the 2011 MODSIM World Conference and Expo, Virginia Beach, VA, USA, October 11-14, 2011.*

Harper, T., Miller, J., Hill, R., Wirthlin, J., (2011) Agent Based Simulation Design for Aggregation and Disaggregation, *Proceedings of the 2011 Winter Simulation Conference, S. Jain, R.R. Creasey, J., Himmelspach, K.P. White, and M. Fu, eds.*

Landry, K., Wirthlin, J., Thal, A., (2011) Exploring the Effects of International Traffic in Arms Regulations on Innovation in the US Space Industry, Long Beach, CA, AIAA Space 2011, September 27-29, 2011.

Homan, J., Parker, C., Wirthlin, J., Pignatiello, J., (2011) Flight Testing Meets Lean Process Improvements, *Proceedings of the IIE Engineering Lean and Six Sigma Conference, Atlanta, GA, USA, September 13-14, 2011.*

McGrogan, J., Schneider, M., Wirthlin, J., Colombi, J., Miller, M., Predicting the Impact of Multi-Aircraft Control on UAS Operations (2011), *Proceedings of the 2011 Industrial Engineering Research Conference, T. Doolen and E. Van Aken, eds, Reno, Nevada, May 21 – 25, 2011.*

Wirthlin, J., Madachy, R., Houston, D., (2011) Defense Acquisition System Simulation Studies, *Proceedings of the 2011 International Conference on Software and Systems Process, Honolulu, Hawaii, May 21 – 22, 2011.*

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Scharch, M., Homan, J., Jacques, D., Wirthlin, J., Heminger, A., (2011) Application and Validation of Concept Maturity Assessment Framework, *Proceedings CSER 2011, Los Angeles, CA, April 15 – 16.*

La Tour, P., Colombi, J., Wirthlin, J., (2011) Integrate-Modify-Create: Applying Multi-Criteria Decision Analysis to Rapid Prototyping, *Proceedings CSER 2011, Los Angeles, CA, April 15 – 16.*

Schneider, M., McGrogan, J., Wirthlin, J., Colombi, J., Miller, J., (2011) Using Discrete Event Simulation for Manpower Estimates of Semiautonomous Systems, Proceedings CSER 2011, Los Angeles, CA, April 15 – 16.

Mitchell, A., Wallace, K., Wirthlin, J., (2011) Addressing the Challenges Educating Systems Engineers for the Armed Forces, 2011 IEEE International Systems Conference, Montreal, Canada, April 4 – 7, 2011.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Tran, T., Wirthlin, J., (2011) Geo-engineering and its Side Effects, 20th International Conference for the International Association of Management of Technology, Miami Beach, FL, April 10 – 14, 2011.

Richey, M., Wirthlin, J., (2011) Responding to Environmental Challenges, 20th International Conference for the International Association of Management of Technology, Miami Beach, FL, April 10 – 14, 2011.

Wirthlin, J. (May 2010, Nov 2010, May 2011) Approaches to Modeling Defense Systems, Presented at Defense Modeling and Simulation Course, Lawrence Tech University, Southfield, MI.

Wirthlin, J. (2010) Modeling Dynamic Relationships in DOD Weapon System Acquisition, TAG-64 (DOD Human Factors Engineering Technical Advisory Group), 26 October 2010, San Jose, CA.

Editorial Board, Defense Acquisition Review Journal (2011 – present).

Senior Advisory Group member, Wright-Patt 2011 AFRL Commander's Challenge Team.

Publications Co-Chair for the 2011 IEEE System of Systems Engineering Conference, Albuquerque, NM.

Track chair for 2011 IEEE System of Systems Engineering Conference, Albuquerque, NM.

Founding Member, Special Interest Group (SIG), Risk Management Processes and Methods in Design, The Design Society, First meeting at ICED2011, Copenhagen, Denmark, Aug 15-18, 2011.

Editorial Board, IEEE Systems Journal (2010 - present), Associate Editor.

INCOSE Lean Working Group (2010 - present).

Editorial Board, Journal of Enterprise Transformation (2009 – present).

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

SPONSOR FUNDED RESEARCH PROJECTS

“Characterization of Air Emissions and geospatial Exposure Modeling from Burning of Waste at Deployed Military Locations.” Sponsor: HQ AF/SGRS. Funding: \$188,436 – Yamamoto 60%, Sitzabee 20%, Thal 20%.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Yamamoto, D.P., Air Emissions Characterization and Geospatial Exposure Modeling from Open Burning of Representative Military Deployed Waste, AFMS Medical Research Symposium, Washington DC, 2-4 August 2011.

Yamamoto, D.P. and J. Rinker, US Air Force Burn Pit Emissions Research: An Update, 2011 National Environmental Health Association Annual Education Conference & Exposition and Uniformed Services Environmental Health Association Annual Conference, Columbus OH, 20 June 2011.

Yon, R., J. Slagley, and D. Yamamoto, Potential Advanced Composite Materials Exposure During Aircraft Structural Maintenance Operations, 2011 American Industrial Hygiene Conference & Exposition, Portland OR, 16-19 May 2011.

Black J., C. Cooper, J. Slagley, and D. Yamamoto, Concentration Factor as a Function of Particle Size and Sampling Flow Rate for the Virtual Impactor of the XMX/2L-MIL Biological Air Sampler, 2011 American Industrial Hygiene Conference & Exposition, Portland OR, 16-19 May 2011.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

American Industrial Hygiene Association Continuing Education Committee.

University of Cincinnati Pilot Research Program Steering Committee.

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

FADUL, JOSE E., *Using Reputation Based Trust to Overcome Malfunctions and Malicious Failures in Electric Power Protection Systems*. AFIT/DEE/ENG/11-08. Faculty Advisor: Dr. Kenneth M. Hopkinson. Sponsor: AFOSR.

MORRISON, JAMIE R., *Vision Aided Inertial Navigation System Augmented with a Coded Aperture*. AFIT/DCE/ENG/10-14. Faculty Advisor: Dr. John F. Raquet. Sponsor: AFRL/RV.

SECREST, BARRY R., *A Linear Combination of Heuristics Approach to Spatial Sampling Hyperspectral Data for Target Tracking*. AFIT/DEE/ENG/10-08. Faculty Advisor: Maj Michael J. Mendenhall. Sponsor: AFRL/RV.

6.1.2 MASTER'S THESES

BEICH, JONATHAN W., *Vision-Aided Autonomous Precision Weapon Terminal Guidance Using a Tightly-Coupled INS and Predictive Rendering Techniques*. AFIT/GE/ENG/11-42. Faculty Advisor: Lt Col Michael J. Veth. Sponsor: Draper Laboratory.

BOND, ROBERT M., *Emerging Threat Detection Methods for GPS C/A Code Receivers*. AFIT/GE/ENG/11-02. Faculty Advisor: Dr. John F. Raquet. Sponsor: SMC.

CHRISTEL, BRADY T., *Two Dimensional Positioning and Heading Solution for Flying Vehicles Using a Line-Scanning Laser Radar (LADAR)*. AFIT/GE/ENG/11-04. Faculty Advisor: Lt Col Michael J. Stepaniak. Sponsor: N/A.

CLIMER, JONATHON R., *Overcoming Pose Limitations of a Skin-Cued Histograms of Oriented Gradients Dismount Detector through Contextual Use of Skin Islands and Multiple Support Vector Machines*. AFIT/GE/ENG/11-05. Faculty Advisor: Maj Michael J. Mendenhall. Sponsor: 711 HPW/RH.

COOPER, CHRISTOPHER M., *A Framework for the Measurement of Simulated Behavior Performance*. AFIT/GCE/ENG/11-02. Faculty Advisor: Lt Col Brett J. Borghetti. Sponsor: 711 HPW/RH.

DUNCAN, MARK C., *Trust Management and Security in Satellite Telecommand Processing*. AFIT/GCO/ENG/11-03. Faculty Advisor: Dr. Kenneth M. Hopkinson. Sponsor: AFOSR.

GREVE, GABRIEL H., *Network Security Toolkit Including Heuristic Solutions for Trust System Placement and Network Obfuscation*. AFIT/GCS/ENG/10-08. Faculty Advisor: Dr. Kenneth M. Hopkinson. Sponsor: AFOSR.

HAMILTON, NICOLAS S., *Long Term Quadrotor Stabilization*. AFIT/GE/ENG/11-13. Faculty Advisor: Lt Col Michael J. Stepaniak. Sponsor: N/A.

HANCOCK, DAVID, *A Multi Agent System for Flow-Based Intrusion Detection Using Reputation and Evolutionary Computation*. AFIT/GCS/ENG/11-02. Faculty Advisor: Dr. Gary B. Lamont. Sponsor: AFRL/RV.

HOWARD, CARL N., *Initial Design and Development of an Extended Feature Colony I CubeSat Bus*. AFIT/GE/ENG/11-15. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: N/A.

HOWARD, JAMES M., *Image Dependent Relative Formation Navigation for Autonomous Aerial Refueling*. AFIT/GE/ENG/11-16. Faculty Advisor: Lt Col Michael J. Veth. Sponsor: AFRL/RV.

JL, JENNY W., *Holistic Network Defense: Fusing Host and Network Features for Attack Classification*. AFIT/GE/ENG/11-18. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: AFRL/RI.

JOHNSON, JEREMIAH D., *Polarimetric Enhancements to Electro-Optical Aided Navigation Techniques*. AFIT/GE/ENG/11-19. Faculty Advisor: Lt Col Jeremy C. Holtgrave. Sponsor: AFOSR.

KIER, TERRA J., *Optical Flow-Based Odometry for Underground Tunnel Exploration*. AFIT/GE/ENG/11-21. Faculty Advisor: Maj Kenneth A. Fisher. Sponsor: AFRL/RX.

KOCH, BRADLEY M., *A Multispectral Bidirectional Reflectance Distribution Function Study of Human Skin for Improved Dismount Detection*. AFIT/GE/ENG/11-22. Faculty Advisor: Maj Michael J. Mendenhall. Sponsor: 711 HPW/RH.

LEE, SPENSER D., *Routing UAVs to Co-Optimize Mission Effectiveness and Network Performance with Dynamic Programming*. AFIT/GCS/ENG/11-04. Faculty Advisor: Dr. Kenneth M. Hopkinson. Sponsor: AFRL/RV.

LICHTFUSS, ERICH H., *Non-GPS Navigation Using Vision-Aiding and Active Radio Range Measurements*. AFIT/GE/ENG/11-23. Faculty Advisor: Lt Col Michael J. Veth. Sponsor: Raytheon.

MAIER, MATTHEW J., *Estimating Anthropometric Marker Locations from 3-D LADAR Point Clouds*. AFIT/GE/ENG/11-27. Faculty Advisor: Maj Michael J. Mendenhall. Sponsor: 711 HPW/RH.

NOEL, WILFRED E., *Signals of Opportunity Navigation Using Wi-Fi Signals*. AFIT/GCE/ENG/11-30. Faculty Advisor: Maj Kenneth A. Fisher. Sponsor: AFRL/RV.

PRAHL, DAYVID, *Coupling Vanishing Point Tracking with Inertial Navigation to Estimate Attitude in a Structured Environment*. AFIT/GE/ENG/11-33. Faculty Advisor: Lt Col Michael J. Veth. Sponsor: AFRL/RV.

RICE, ANDREW C., *Context Aided Tracking with Adaptive Hyperspectral Imagery*. AFIT/GE/ENG/11-43. Faculty Advisor: Dr. Juan R. Vasquez. Sponsor: AFRL/RV.

RONDEAU, CHRISTOPHER M., *Navigation with Limited Prior Information Using Time Difference of Arrival Measurements from Signals of Opportunity*. AFIT/GE/ENG/10-32. Faculty Advisor: Dr. Richard K. Martin. Sponsor: AFRL/RV.

SCOTT, AMBER L., *Effects of Cyclic Prefix Jamming Versus Noise Jamming in OFDM Signals*. AFIT/GE/ENG/11-35. Faculty Advisor: Dr. Richard K. Martin. Sponsor: AFRL/RV.

WEEMS, MARK A., *Kernelized Locality-Sensitive Hashing for Fast Image Landmark Association*. AFIT/GE/ENG/11-40. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: AFRL/RV.

WEYERS, CHRISTOPHER P., *Multiple Integrated Navigation Sensors for Improving Occupancy Grid FastSLAM*. AFIT/GCE/ENG/11-08. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: AFRL/RV.

6.1.3 GRADUATE RESEARCH PAPERS

ECKBERG, JASON A., *Cognitive Electronic Warfare: A Model for Future Electronic Warfare Systems*. AFIT/ICW/ENG/11-03. Faculty Advisor: Lt Col Michael J. Stepaniak. Sponsor: AFRL/R.Y.

6.1.4 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.

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

Co, T.C., Zagaris, C., and Black, J.T., “Responsive Satellites through Ground Track Manipulation using Existing Technology,” AIAA Space 2011 Conference, Long Beach, CA, September 2011, AIAA Paper 2011-7262.

Niederhauser, J.D., and J.T. Black, “Characterization and Analysis for Flying COTS Electronics On-Orbit,” 25th AIAA Utah State University Conference on Small Satellites, Logan, UT, August 2011, Paper SSC11-XII-3.

Debes, J., Howard, N., Harrington, R., Cobb, R., and J. Black, “Rapid Build and Space Qualification of CubeSats,” 25th AIAA Utah State University Conference on Small Satellites, Logan, UT, August 2011, Paper SSC11-VII-7.

BORGHETTI, BRETT J., Lt Col, Department of Electrical and Computer Engineering

SPONSOR FUNDED RESEARCH PROJECTS

“Artificial Intelligent Agents for City Beat Program.” Sponsor: AFRL/RH. Funding: \$155,000.

COBB, RICHARD G., Department of Aeronautics and Astronautics

SPONSOR FUNDED RESEARCH PROJECTS

“Hyperactive Fin.” Sponsor: 95 CPTS. Funding: \$10,921.

“Dynamic Two-Way Time Transfer CubeSat Experiment.” Sponsor: AS&T. Funding: \$110,000 – Cobb 45%, Black 45%, Raquet 10%.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Anderson, M. and Cobb, R., “Evaluation of Bi-harmonic Amplitude and Bias Modulation for Flapping Wing MAV Control,” Proceedings of the 49th AIAA Aerospace Sciences Meeting, Orlando, FL, January 2011, AIAA-2011-1161.

Anderson, M., Sladek, N., and Cobb R., “Design, Fabrication, and Testing of an Insect-Sized MAV Wing Flapping Mechanism,” Proceedings of the 49th AIAA Aerospace Sciences Meeting, Orlando, FL, January 2011.

FISHER, KENNETH A., Maj, Department of Electrical and Computer Engineering

SPONSOR FUNDED RESEARCH PROJECTS

“Non-GPS Navigation Using Radio-Based Ranging Combined with Additional Sensors ("Net-Enabled Non-GPS Navigation").” Sponsor: Raytheon. Funding: \$44,873 – Fisher 50%, Raquet 50%.

“Air-to-Air Missile Flight Path Reconstruction.” Sponsor: 95 CPTS. Funding: \$39,079.

“Increased Understanding of Vision-Aided Navigation Uncertainty Estimates.” Sponsor: AFRL/RV. Funding: \$50,000 – 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, Vol. XXVI, No. 2, pp. 24-33, Summer 2011.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Paper reviewer for *IEEE Transactions on Automatic Control* journal.

AFOSR proposal reviewer for Dr. Jon Sjogren (area: signals of opportunity navigation).

Served as Subject Matter Expert to DARPA on Robust Surface Navigation Program.

Guidance, Navigation, and Control Curriculum Chair.

Session Chair for ION GNSS 2011.

HARMON, FREDERICK G., Lt Col, Department of Aeronautics and Astronautics

SPONSOR FUNDED RESEARCH PROJECTS

“Parallel Hybrid-Electric Propulsion System for a Small Remotely Piloted Aircraft.” Sponsor: AFRL/RZ. Funding: \$20,000.

HOPKINSON, KENNETH M., Department of Electrical and Computer Engineering

SPONSOR FUNDED RESEARCH PROJECTS

“A Context-Aware Middleware Architecture to Enable Large-Scale Networking.” Sponsor: AS&T. Funding: \$131,848.

“Technical Support: Cognitive and Mobile Networks.” Sponsor: AFRL/RI. Funding: \$80,000 – Hopkinson 60%, Thomas 40%.

“A Context-Aware Approach for Enabling Large-Scale Mobile Networks.” Sponsor: AFOSR. Funding: \$41,408.

MARTIN, RICHARD K., Department of Electrical and Computer Engineering

SPONSOR FUNDED RESEARCH PROJECTS

“Distributed TDOA-Based Source Localization.” Sponsor: AFOSR. Funding: \$31,041 – Martin 50%, Fisher 50%.

REFERRED JOURNAL PUBLICATIONS

Michael J. Veth, Richard K. Martin, and Meir P. Pachter, "Anti-aliasing Constraints for Image-based Feature Tracking Applications With and Without Inertial Aiding," IEEE Transactions on Vehicular Technology, Vol. 59, No. 8, October 2010, pp. 3744-3756.

Richard K. Martin, Chunpeng Yan, H. Howard Fan, and Christopher Rondeau, "Algorithms and Bounds for Distributed TDOA-Based Positioning Using OFDM Signals," IEEE Transactions on Signal Processing, Vol. 59, No. 3, March 2011, pp. 1255-1268.

PACHTER, MEIR, Department of Electrical and Computer Engineering

SPONSOR FUNDED RESEARCH PROJECTS

"Cooperative Control." Sponsor: AFRL/RB. Funding: \$10,000.

"Decision Support Techniques." Sponsor: AFRL/RV. Funding: \$15,000.

"Cooperative Intelligent Control & Estimation." Sponsor: AFOSR. Funding: \$48,647.

"Games, Information and Deception Exploitation for Adversarial Network Systems." Sponsor: AFOSR. Funding: \$46,986.

"Advanced Autonomous Navigation." Sponsor: AFRL/RV. Funding: \$15,000.

REFEREED JOURNAL PUBLICATIONS

M. Veth, R. Martin, and M. Pachter, "Anti-aliasing Constraints for Image-based Feature Tracking Applications With and Without Inertial Aiding," IEEE Transactions on Vehicular Technology, Vol. 59, No. 8, October 2010, pp. 3744-3756.

Y. Cao, G. GU and M. Pachter, "Target Motion Analysis Based on Peak Power Measurements Using Networked Sensors," IEEE Transactions on Aerospace and Electronic Systems, Vol. 47, No. 2, April 2011.

K. Krishnamoorthy, M. Pachter, S. Dhaba, and P. Chandler, "Approximate Dynamic Programming with State Aggregation Applied to UAV Perimeter Patrol," International Journal of Robust and Nonlinear Control, Vol. 21, 2011.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

K. Kalyanam, M. Pachter, and P. Chandler, "State Aggregation Based Linear Programming Approach to Approximate Dynamic Programming," CDC 2010, pp. 935-941, 15-17 December 2010, Atlanta, GA.

M. Pachter and K. Pham, "Basic Issues Concerning the Role of Information in Dynamic Games," International Conference on the Dynamics of Information Systems, 16-18 February 2011, Gainesville, FL.

M. Pachter and Y. Choi, "A Relay-Rover Differential Game," 51st Israel Annual Conference on Aerospace Sciences, 23-24 February 2011, Tel Aviv, Israel.

K. Kalyanam, M. Pachter, and P. Chandler, "UAV Perimeter Patrol Operations Optimization Using Efficient Dynamic Programming," ACC, San Francisco, CA, 29 June – 1 July 2011.

T. Welker, R. Huffman, and M. Pachter, "Use of Gravity Gradiometry in Precision Inertial Navigation," AIAA Guidance, Navigation and Control Conference, Portland, OR, 8-11 August 2011. AIAA paper 2011-6643.

K. Kalyanam, M. Pachter, and P. Chandler, "Maximizing the Throughput of a Patrolling UAV by Dynamic Programming," IEEE Multi-conference on Systems and Control, accepted for presentation, Denver, CO, September 2011.

BOOKS AND CHAPTERS IN BOOKS

M. Pachter and G. Mutlu, "The Navigation Potential of Ground Feature Tracking," in Dynamics of Information Systems: Theory and Applications, pp. 287-303, Springer, 2010.

PETERSON, GILBERT L., Department of Electrical and Computer Engineering

SPONSOR FUNDED RESEARCH PROJECTS

"INSeCT: Intelligent Navigation and Sensing Cooperative Tasks." Sponsor: AFRL/RV. Funding: \$75,113 – Peterson 85%, Raquet 15%.

"UBR-Brawler." Sponsor: ASC/XR. Funding: \$76,000 – Peterson 50%, Borghetti, 50%.

REFEREED JOURNAL PUBLICATIONS

Woolley, B., Peterson, G.L., and Kresge, J.T., Real-Time Behavior Based Robot Control System, *Autonomous Robots*, Vol. 30, No. 3, 2011, pp. 233-242. DOI: 10.1007/s10514-010-9215-y.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Peterson, G. L., Mayer, C.M., and Cousin, K., "WoLF Ant," *IEEE Congress on Evolutionary Computation 2011*, New Orleans, LA, 2011, pp. 557.1-557.8.

Smith, M.J., Boxerbaum, A.J., Peterson, G.L., and Quinn, R.J., "Electronic Image Stabilization using Optical Flow with Inertial Fusion," *2010 IEEE/RSJ International Conference on Intelligent Robots and Systems*, Taipei, Taiwan, October 2010, pp. 1146-1153, DOI: 10.1109/IROS.2010.5651113.

Weyers, C., and Peterson, G.L., "Improving Occupancy Grid FastSLAM by Integrating Navigation Sensors," *IEEE/RSJ International Conference on Intelligent Robots and Systems*, San Francisco, CA, 2011, pp. TBD.

RAQUET, JOHN F., Department of Electrical and Computer Engineering

SPONSOR FUNDED RESEARCH PROJECTS

"Precision Indoor and Outdoor Navigation Using Existing Signals of Opportunity and Inertial Navigation Sensors." Sponsor: DAGSI. Funding: \$21,420.

"ANT Center Laboratory Support per Attachment 6 of the MOA between AFIT and AFRL." Sponsor: AFRL/RV. Funding: \$310,000 – Raquet 50%, Fisher 50%.

"Passive Optical Navigation using Polarimetric Imaging Sensors." Sponsor: AFOSR. Funding: \$29,500.

"Support of Sfcs-Based Underground Geopositioning (S-BUG) Program." Sponsor: DARPA. Funding: \$20,000.

"Image-Aided Navigation for Automated Aerial Refueling." Sponsor: AFRL/RB. Funding: \$265,000 – Raquet 50%, Fisher 50%.

"Ultra-High Accuracy Reference System (UHARS) Support." Sponsor: 746 TS. Funding: \$100,000 – Raquet 90%, Fisher 10%.

“Testbed Development for All-Source Positioning and Navigation (ASPN) Program.” Sponsor: DARPA. Funding: \$201,428 – Raquet 40%, Fisher 40%, Peterson 20%.

REFEREED JOURNAL PUBLICATIONS

Fisher, K., and J. Raquet, “Non-GPS Precision Position, Navigation, and Timing,” Air and Space Power Journal, Vol. XXV, No. 2, pp. 24-33, Summer 2011.

Taylor, C., M. Veth, J. Raquet, and M. Miller, “Techniques for Navigation in Unmapped Environments,” IEEE Transactions on Aerospace and Electronic Systems, Vol. 47, No. 2, pp. 946-958, April 2011.

Larson, C., J. Raquet, and M. Veth, “The Impact of Attitude on Image-Based Integrity,” NAVIGATION: Journal of the Institute of Navigation, Vol. 57, No. 4, pp. 249-262, Winter 2010.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

D. Venable, J. Campbell, J. Raquet, and M. Veth, “Image-Aided Navigation Applied: Wide Area Sensing,” presented at 2011 Joint Navigation Conference, Colorado Spring, CO, June 2011.

M. Smearcheck, T. Pestak, J. Kresge, J. Raquet, and K. Fisher, “EO Camera and Lidar Measurements for Autonomous Aerial Refueling Operations,” presented at 2011 Joint Navigation Conference, Colorado Springs, CO, June 2011.

Haker, M., and J. Raquet, “Modeling and Simulation of the GNSS Channel Through the Stochastic Search and Parameterization of Received Signals,” presented at 2011 Joint Navigation Conference, Colorado Springs, CO, June 2011.

Kauffman, K., J. Raquet, Y. Morton, and D. Garmatyuk, “Simulation Study of UWB-OFDM SAR for Navigation with INS Integration,” Proceedings of ION International Technical Meeting, San Diego, CA, January 2011.

Storms, W. J. Shockley, and J. Raquet, “Magnetic Field Navigation in an Indoor Environment,” Proceedings of Ubiquitous Positioning Indoor Navigation and Location Based Service (UPINLBS) (in IEEE Xplore), October 2010.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Raquet, J., and J. Campbell, “GPS 101,” tutorial taught to 100 attendees of 2011 Joint Navigation Conference, June 2011.

Raquet, J., “GPS Receiver Design,” presented to 45 industrial members and students from COUNT Consortium, June 2011.

Raquet, J., “Alternative Navigation Topics,” presented to 30 engineers at the Precision Navigation and Timing Workshop with Singapore (sponsored by AFOSR), December 2010.

Raquet, J., and M. Veth, “Vision Based Navigation,” presented to 30 engineers at the Precision Navigation and Timing Workshop with Singapore (sponsored by AFOSR), December 2010.

Raquet, J., and G. Peterson, “Cooperative and Autonomous Vehicles,” presented to 30 engineers at the Precision Navigation and Timing Workshop with Singapore (sponsored by AFOSR), December 2010.

AFIT PI for the Consortium of Ohio Universities on Navigation and Timekeeping (COUNT).

Office of the Secretary of Defense (OSD) PNT S&T Roadmap, January 2007 – present. Helping to update the OSD PNT S&T Roadmap, which is a document describing the S&T activities for PNT technology over the next 20 years.

Chairman, Institute of Navigation (ION) Satellite Division.

Scientific (organizing) committee, International Conference on Ubiquitous Positioning, Indoor Navigation, and Location-Based Service, Helsinki, Finland, October 2010.

Awards Committee Member, Institute of Navigation (ION).

AFRL/RV, consulting support for LEGAND program, March 2008 – present.

DARPA, consulting support for S-BUG and RSN navigation programs, January 2009 – present.

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 33.3%, Cobb 33.3%, Black 33.3%.

STEPANIAK, MICHAEL J., Lt Col, Department of Electrical and Computer Engineering

SPONSOR FUNDED RESEARCH PROJECTS

“Integrated Precision Ordnance Delivery System (IPODS) Support.” Sponsor: DTRA. Funding: \$45,000.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Oktay, H., and M. J. Stepaniak, “Airborne Pseudolites in a Global Positioning System Degraded Environment,” Proceedings of the 5th International Conference on Recent Advances in Space Technology, Istanbul, Turkey, pp. 280-285, June 2011.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Technical evaluator for AFRL/DTRA \$7.5M IPODS Phase II contract.

6.2. CENTER FOR CYBERSPACE RESEARCH

Center for Cyberspace Research (CCR)

Director 255-6565 x4278

Associate Director 255-6565 x4445

Executive Program Coordinator 255-3636 x4602

Homepage: <http://www.afit.edu/ccr/>

6.2.1 DOCTORAL DISSERTATIONS

DUBE, THOMAS E., *A Novel Malware Target Recognition Architecture for Enhanced Cyberspace Situation Awareness*. AFIT/DCE/ENG/11-07. Faculty Advisor: Dr. Richard A. Raines. Sponsor: N/A.

6.2.2 MASTER'S THESES

BARES, DAVID C., *Satellite Security: Obfuscating Command Link Messages*. AFIT/GCO/ENG/11-01. Faculty Advisor: Maj Eric M. Trias. Sponsor: AFOSR.

CAGURANGAN, ERIC T., *Using an Intrusion Detection System to Protect Flight Control Software*. AFIT/GCS/ENG/11-01. Faculty Advisor: Lt Col Jeffrey W. Humphries. Sponsor: N/A.

GARCIA, ERIC W., *Evaluation of the Single Keybit Template Attack*. AFIT/GE/ENG/11-11. Faculty Advisor: Dr. Rusty O. Baldwin. Sponsor: NSA.

HENRY, WAYNE C., *Covert Channels within IRC*. AFIT/GCE/ENG/11-04. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: 688 IOW.

HUBER, KEVIN E., *Host-Based Systemic Network Obfuscation System for Windows*. AFIT/GCO/ENG/11-05. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: N/A.

KRUG, MICHELLE C., *Insider Threat Detection Using Microsoft Event Viewer Log Files*. AFIT/GCO/ENG/10-19. Faculty Advisor: Dr. Rusty O. Baldwin. Sponsor: N/A.

KUHAR, BENJAMIN B., *Twitter Malware Collection System: An Automated URL Extraction and Examination Platform*. AFIT/GCO/ENG/11-07. Faculty Advisor: Dr. Rusty O. Baldwin. Sponsor: N/A.

LUSTIC, KEVIN C., *Performance Analysis and Optimization of the Winnow Secret Key Reconciliation Protocol*. AFIT/GCO/ENG/11-08. Faculty Advisor: Lt Col Jeffrey W. Humphries. Sponsor: N/A.

MERRIT, DAVID T., *Spear Phishing Attack Detection*. AFIT/GCE/ENG/11-05. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: 688 IOW.

MILLER, JAMES L., *An Architecture for Improving Timeliness and Relevance of Cyber Incident Notifications*. AFIT/GCO/ENG/11-09. Faculty Advisor: Dr. Robert F. Mills. Sponsor: 711 HPW/RH.

NIELSEN, JASON R., *Evaluating Information Assurance Control Effectiveness on an Air Force Supervisory Control and Data Acquisition (SCADA) System*. AFIT/GCO/ENG/11-10. Faculty Advisor: Maj Jeffrey M. Hemmes. Sponsor: N/A.

OSTLER, RYAN T., *Defensive Cyber Battle Damage Assessment through Attack Methodology Modeling*. AFIT/GCO/ENG/11-11. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: N/A.

OWEN, TOMAS G., *Evaluation of the Effectiveness of Various Protection Mechanisms against Smart Card-Borne Threats*. AFIT/GCO/ENG/11-12. Faculty Advisor: Lt Col Jeffrey W. Humphries. Sponsor: N/A.

SCHOCKLING, MINDY K., *Zero-Knowledge Authentication in Mobile Ad Hoc Networks*. AFIT/GCO/ENG/11-13. Faculty Advisor: Dr. Rusty O. Baldwin. Sponsor: AFRL/RI.

SCOTT, JEFFREY B., *Automated Analysis of ARM Binaries Using the Low-Level Virtual Machine Compiler Framework*. AFIT/GCO/ENG/11-14. Faculty Advisor: Dr. Rusty O. Baldwin. Sponsor: N/A.

STANGE, JACOB M., *Authentication Theft: An Attack on .NET Smart Cards*. AFIT/GCO/ENG/11-15. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: N/A.

STUECKLE, JONATHAN D., *Android Protection System: A Signed Code Security Mechanism for Smartphone Applications*. AFIT/GCE/ENG/11-06. Faculty Advisor: Dr. Rusty O. Baldwin. Sponsor: NSA.

WAGONER, LAUREN M., *Detecting Man-in-the-Middle Attacks against Transport Layer Security Connections with Timing Analysis*. AFIT/GCO/ENG/11-16. Faculty Advisor: Lt Col Jeffrey W. Humphries. Sponsor: N/A.

WILLIAMS, MCKAY D., *Application of RF-DNA Fingerprinting to Improve WiMAX Security*. AFIT/GE/ENG/11-41. Faculty Advisor: Dr. Michael A. Temple. Sponsor: AFRL/RV.

WOOLINGHAM, MICHAEL R., *Detecting Insider Threats on a Cisco Router Using the Native Functionality of the Internetwork Operating System*. AFIT/GCO/ENG/11-17. Faculty Advisor: Dr. Robert F. Mills. Sponsor: NSA.

6.2.3 GRADUATE RESEARCH PAPERS

BARCOMB, KRIS E., *Taking the High Ground: A Case for Department of Defense Application of Public Cloud Computing*. AFIT/ICW/ENG/11-01. Faculty Advisor: Dr. Robert F. Mills. Sponsor: N/A.

BISHOP, BENJAMIN W., *An Assessment of Napoleonic Command and Control Principles in Air Force Network Defense Operations*. AFIT/ICW/ENG/11-02. Faculty Advisor: Capt Jonathan W. Butts. Sponsor: 561 NOS.

FRAMPTON, JONATHAN J., *Achieving National Unity of Effort in Cyber*. AFIT/ICW/ENG/11-04. Faculty Advisor: Dr. Michael R. Grimaila. Sponsor: N/A.

HAMMOND, CHRISTOPHER B., *Integration of Cyberspace Operations and Conventional Kinetic Air Operations*. AFIT/ICW/ENG/11-05. Faculty Advisor: Lt Col David J. Robinson. Sponsor: N/A.

LAVINE, DAVID A., *Leveraging ITIL/ITSM into Network Operations*. AFIT/ICW/ENG/11-07. Faculty Advisor: Capt Jonathan W. Butts. Sponsor: 561 NOS.

MARTINO, RICHARD A., *Leveraging Traditional Battle Damage Assessment Procedures to Measure Effects from a Computer Network Attack*. AFIT/ICW/ENG/11-08. Faculty Advisor: Dr. Robert F. Mills. Sponsor: NASIC.

MCCALLIE, DONALD L., *Exploring Potential ADS-B Vulnerabilities in the FAA's NextGen Air Transportation System*. AFIT/ICW/ENG/11-09. Faculty Advisor: Capt Jonathan W. Butts. Sponsor: N/A.

MYERS, MICHAEL J., *Emerging Roles of Combat Communication Units in Cyber Warfare as Related to Computer Network Attack, Defense and Exploitation*. AFIT/ICW/ENG/11-10. Faculty Advisor: Dr. Michael R. Grimaila. Sponsor: 689 CCW.

NELSON, ALEXANDER D., *Patching the Wetware: Addressing the Human Factor in Information Security*. AFIT/ ENG/ICW/011-11. Faculty Advisor: Dr. Robert F. Mills. Sponsor: N/A.

TERRY, KATRINA A., *Overcoming the Support Focus of the 17D Cyberspace Operations Career Field*. AFIT/ICW/ENG/11-12. Faculty Advisor: Dr. Robert F. Mills. Sponsor: SAF/A60.

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.

AKERS, GEOFFREY A., Lt Col, Department of Electrical and Computer Engineering

SPONSOR FUNDED RESEARCH PROJECTS

“Radio Frequency Waveform Exploitation.” Sponsor: NSA. Funding: \$50,000 – Akers 46%, Jackson 46%, Terzuoli 8%.

BALDWIN, RUSTY O., Department of Electrical and Computer Engineering

SPONSOR FUNDED RESEARCH PROJECTS

“Side-Channel Analysis Resistant Advanced Encryption Standard (AES) FPGA Intellectual Property (IP).” Sponsor: AFRL/RY. Funding: \$490,000.

“Technical Support, Military Medical System Modeling.” Sponsor: TRICARE. Funding: \$4,100,000 – Baldwin 75%, Raines 25%.

“Technical Support S/W Development.” Sponsor: NSA. Funding: \$228,466 – Baldwin 75%, Raines 25%.

SPONSOR FUNDED EDUCATIONAL PROJECTS

“Federal Cyber Service: Scholarship for Service (SFS).” Sponsor: NSF. Funding: \$811,341.

REFEREED JOURNAL PUBLICATIONS

W. E. Cobb, E. D. Laspe, R. O. Baldwin, M. A. Temple, and Y. C. Kim, “Intrinsic Physical Layer Authentication of Integrated Circuits,” accepted for publication in *Transactions on Information Forensics & Security*, Mar 2011, 24 pgs.

D. J. Kelly, R. A. Raines, R. O. Baldwin, B. E. Mullins, and M. R. Grimala, “Exploring Extant and Emerging Issues in Anonymous Networks: A Taxonomy and Survey of Protocols and Metrics,” *IEEE Communications Surveys and Tutorials*, Vol. PP, No. 99, pp. 1-28, June 13 2011.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

W. E. Cobb, E. W. Garcia, M. A. Temple, R. O. Baldwin, and Y. C. Kim, “Physical Layer Identification of Embedded Devices Using RF-DNA Fingerprinting,” *2010 IEEE Military Communications Conference (MILCOM 2010)*, San Jose, CA, October 2010, pp. 682-687.

PATENTS

D. P. Montminy, R. O. Baldwin and P. D. Williams, “Relocatable Field Programmable Gate Array Bitstreams for Fault Tolerance,” Patent #7,906,984, Mar 2011.

GRMAILA, MICHAEL R., Department of Systems and Engineering Management

SPONSOR FUNDED RESEARCH PROJECTS

“Communication Channel Security.” Sponsor: LTS. Funding: \$200,000 – Grmaila 50%, Humphries 50%.

MILLS, ROBERT F., Department of Electrical and Computer Engineering

SPONSOR FUNDED RESEARCH PROJECTS

“Ontological Modeling of the Cyber Vulnerability Analysis Task.” Sponsor: AFRL/RV. Funding: \$28,540.

REFEREED JOURNAL PUBLICATIONS

McCallie, D., Butts, J., and Mills, R., “Security Analysis of the ADS-B Implementation in the Next Generation Air Transportation System,” *International Journal of Critical Infrastructure Protection*, pp 1-10, July 2011.

Principi, P.D., Mills, R.F., and Stepaniak, M.J., “Mitigating Tactical Warfighter Dependence on Link-16,” *USAF Weapons Review*, Spring/Summer 2011, pp 25-49 (10 pages).

Mills, R.F., Grmaila, M.R., Peterson, G.L., and Butts, J.W., “A scenario-based approach to mitigating the insider threat,” *Information Systems Security Association Journal*, May 2011, pp 12-19.

Birdwell, M.B., and Mills, R., “Warfighting in Cyberspace: Evolving Force Presentation and Command and Control,” *Air and Space Power Journal*, Spring 2011, Volume XXV, No. 1, pp 26-36. Article will also appear in *Air and Space Power Journal – Chinese Edition*, Summer 2011, Volume 5, No. 2.

Grmaila, 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*, pp. 1-23, March 2011.

Schrader, K.R., Mullins, B.E., Peterson, G.L., and Mills, R.F., “An FPGA-based System for Tracking Digital Information Transmitted via Peer-to-Peer Protocols,” *International Journal of Security and Networks (IJSN)*, Vol. 5, No. 4, pp. 236-247, 2011.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Woskov, S.M., Grmaila, M.R., Mills, R.F., and Haas, M.W., “Design Consideration for a Case-Based Reasoning Engine for Scenario-Based Cyber Incident Notification,” 2011 IEEE Symposium Series on Computational Intelligence in Cyber Security (CICS 2011), Paris, France, April 2011.

Miller, J.L., Mills, R.F., Grmaila, M.R., and Haas, M.W. “A Scalable Architecture for Improving the Timeliness and Relevance of Cyber Incident Notifications,” 2011 IEEE Symposium Series on Computational Intelligence in Cyber Security (CICS 2011), Paris, France, pp. 1-8, April 2011.

Myers, J., Grmaila, M.R., and Mills, R.F., “Log-Based Distributed Security Event Detection Using Simple Event Correlator,” accepted for Hawaii International Conference on System Sciences (HICSS-44), pp. 1-7, Jan 2011.

Grmaila, M.R., Mills, R.F., Haas, M., and Kelly, D., “Mission Assurance: Issues and Challenges,” 2010 International Conference on Security and Management (SAM10), Las Vegas NV, 2010, pp 651-657.

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: \$192,138 – Mullins 20%, Humphries 20%, Butts 20%, Robinson 20%, Raines 20%.

“Cyber Operations Support.” Sponsor: AFRL/RV. Funding: \$18,765 – Mullins 67%, Baldwin 33%.

SPONSOR FUNDED EDUCATIONAL PROJECTS

“IASP Tuition and Resource Support for the AFIT Center for Cyberspace Research (CCR).” Sponsor: NSA.
Funding: \$247,026 – Mullins 50%, Raines 50%.

PETERSON, GILBERT L., Department of Electrical and Computer Engineering

SPONSOR FUNDED RESEARCH PROJECTS

“MEMSENSE: Hypervisor-Based Memory Sensing for Network Defense Applications,” Sponsor: AFRL/RI.
Funding: \$105,000 – Peterson 34%, Mullins 33%, Kim 33%.

RAINES, RICHARD A., Department of Electrical and Computer Engineering

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

T. Dube, R. Raines, G. Peterson, K. Bauer, M. Grimaila, and S. Rogers, “Malware Type Recognition and Cyber Situational Awareness,” *The Second IEEE International Conference on Information Privacy, Security, Risk and Trust*, 2010 Minneapolis MN, 10% acceptance rate, pp 938-943.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Panel Member/Reviewer for National Science Foundation 2011.

Session Chair, 5th Annual IFIP WG 11.10 International Conference on Critical Infrastructure Protection, Dartmouth College, Hanover NH.

Member, National Board for Information Security Examiners.

Member, Program Committee, 15th *Colloquium for Information Systems Security Education (CISSE)*.

Provided 39 invited cybersecurity talks and presentations to AF, DOD, and Federal Government agencies.

TEMPLE, MICHAEL A., Department of Electrical and Computer Engineering

SPONSOR FUNDED RESEARCH PROJECTS

“Phase III Support: RF-EW Systems.” Sponsor: AFRL/RV. Funding: \$377,000.

“RFINT for Commercial Communications.” Sponsor: AS&T. Funding: \$99,952.

“CR/SDR-Based RFINT Technologies.” Sponsor: LTS. Funding: “\$44,924.

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

ANDERSON, MONTE D., *Tunable Optical Delay in Doppler-Broadened Cesium Vapor*. AFIT/DS/ENP/10-S01. Faculty Advisor: Dr. Glen P. Perram. Sponsor: HELJTO.

BELCHER, LACHLAN T., *Gradients and Non-Adiabatic Derivative Coupling Terms for Spin-Orbit Wavefunctions*. AFIT/DS/ENP/11-J01. Faculty Advisor: Dr. David E. Weeks. Sponsor: HELJTO.

HOELSCHER, MARK G., *Restoration of Scene Information Reflected from Non-Specular Media*. AFIT/DS/ENP/11-M03. Faculty Advisor: Dr. Michael A. Marciniak. Sponsor: AFRL/RX.

LEWIS, CHARLTON D., II, *Non-Adiabatic Atomic Transitions: Computational Cross Section Calculations of Alkali Metal-Noble Gas Collisions*. AFIT/DS/ENP/11-S04. Faculty Advisor: Dr. David E. Weeks. Sponsor: HELJTO.

6.3.2 MASTER'S THESES

CROZIER, STANLEY D., *Development of an Interference Lithography Capability Using a Helium Cadmium Ultraviolet Multimode Laser for the Fabrication of Sub-Micron-Structured Optical Materials*. AFIT/GE/ENG/11-07. Faculty Advisor: Dr. Michael M. Marciniak. Sponsor: AFRL/RX.

FOX, CHARLES D., *Radial Distribution of Absorption in a Cesium Heat Pipe with Axial Laser Heating*. AFIT/GAE/ENY/11-M09. Faculty Advisor: Dr. Glen P. Perram. Sponsor: HELJTO.

GUILD, ERIC M., *Diffusion of Rubidium Vapor through Hollow-Core Fibers for Gas-Phase Fiber Lasers*. AFIT/OSE/ENP/11-M01. Faculty Advisor: Dr. Glen P. Perram. Sponsor: HELJTO.

HURD, EDWARD J., *Characteristics of a High Intensity, Pulsed, Potassium Vapor Laser in a Heat Pipe*. AFIT/GE/ENG/11-17. Faculty Advisor: Lt Col Jeremy C. Holtgrave. Sponsor: HELJTO.

HURST, BENJAMIN E., *High-Energy Laser Damage Testing on Painted Metals at 1.07 μm* . AFIT/GAP/ENP/11-M02. Faculty Advisor: Dr. Michael A. Marciniak. Sponsor: HELJTO.

MELIN, MEGAN P., *Modeling and Analysis of High Energy Laser Weapon System Performance in Varying Atmospheric Conditions*. AFIT/OR/MS/ENS/11-27. Faculty Advisor: Dr. John O. Miller. Sponsor: AFRL/RD. [COA & CDE]

MILLER, APRIL D., *A Comparison in the Accuracy of Mapping Nuclear Fallout Patterns using HPAC, HYSPLIT, DELFIC FPT and an AFIT FORTRAN95 Fallout Deposition Code*. AFIT/GNE/ENP/11-M16. Faculty Advisor: Dr. Steven T. Fiorino. Sponsor: N/A.

PALM, WILLIAM J., *Multilayer Insulation Laser Damage Characterization for Wavelength Scaling*. AFIT/GAP/ENP/11-M07. Faculty Advisor: Dr. Michael A. Marciniak. Sponsor: HELJTO & AFRL/RX.

SIMMONS, DAVID B., *Integration of a Worldwide Atmospheric Based Model with a Live Virtual Constructive Simulation Environment*. AFIT/GAP/ENP/11-M09. Faculty Advisor: Dr. Steven T. Fiorino. Sponsor: 711 HPW/RH.

SPENCER, MARK F., *Branch Point Mitigation of Thermal Blooming Phase Compensation Instability*. AFIT/OSE/ENP/11-M02. Faculty Advisor: Dr. Salvatore J. Cusumano. Sponsor: HELJTO.

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

REFEREED JOURNAL PUBLICATIONS

Cusumano, S.J., Fiorino, S.T., Bartell, R.J., Krizo, M.J., Bailey, W.F., Beauchamp, R.L., and Marciniak, M.A., "Modeling bi-static spectral measurements of temporally evolving reflected and emitted energy from a distant and receding target," *Journal of Applied Remote Sensing* 5, Article No. 053549, Sep 2011.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Palm, W.J., Marciniak, M.A., Perram, G.P., Gross, K.C., and Bailey, W.F., "Laser-induced damage of Kapton thin films demonstrating temperature and wavelength dependent absorptance: a case study in remote-sensing material analysis," Proceedings of the SPIE Laser Damage Conference, Vol. 8190, 8190-08, Sept 2011.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Palm, W.J., Marciniak, M.A., Perram, G.P., Gross, K.C., and Bailey, W.F., "Laser-induced damage of Kapton thin films demonstrating temperature and wavelength dependent absorptance: a case study in remote-sensing material analysis," presentation at the SPIE Laser Damage Conference, Boulder, CO, 18-21 Sept 2011.

CUSUMANO, SALVATORE J., Department of Engineering Physics

SPONSOR FUNDED RESEARCH PROJECTS

"Tactical High Energy Laser Weapon Alignment System Architecture Efficiencies." Sponsor: HELJTO. Funding: \$89,700.

"Airborne Aero-Optic Laboratory." Sponsor: AFRL/RD. Funding: \$149,480.

"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%.

"Beam Control for Optical Phased Array Weapons." Sponsor: AFOSR. Funding: \$29,958.

"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%.

REFEREED JOURNAL PUBLICATIONS

Cusumano, S.J., Fiorino, S.T., Bartell, R.J., Krizo, M.J., Bailey, W.F., Beauchamp, R.L., and Marciniak, M.A., "Modeling bi-static spectral measurements of temporally evolving reflected and emitted energy from a distant and receding target," *Journal of Applied Remote Sensing* 5, Article No. 053549 (2 Sep 2011).

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Leakeas, Charles L., Capehart, Shay R., Bartell, Richard J., Cusumano, Salvatore J., and Whiteley, Matthew R., "Performance modeling of the effects of aperture phase error, turbulence, and thermal blooming on tiled subaperture systems," Proceedings of the SPIE Atmospheric Propagation VIII, Vol. 8038, Paper No. 803803 (May 2011).

Spencer, Mark F. and Cusumano, Salvatore J., "Impact of branch points in adaptive optics compensation of thermal blooming and turbulence," Proceedings of the SPIE, Vol. 8165, Paper No. 816503 (September 2011).

BOOKS AND CHAPTERS IN BOOKS

Perram, G.P., Cusumano, S.J., Hengehold, R.L., and Fiorino, S.T., *An Introduction to Laser Weapon Systems* (Directed Energy Professional Society, Oct 2010), 463 pp.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Fiorino, S.T., Randall, R.M., Downs, A.D., Bartell, R.J., Krizo, M.J., and Cusumano, S.J., "Three-Dimensional Optical Turbulence Assessments from Doppler Weather Radar for Laser Applications," presentation at the 6th DEPS Systems Symposium, Monterey CA, 28 March -1 April 2011.

Fiorino, S.T., Randall, R.M., Downs, A.D., Bartell, R.J., Krizo, M.J., and Cusumano, S.J., "Three-dimensional optical turbulence assessments from doppler weather radar for laser applications" (Poster), 15th Symposium on Integrated Observing and Assimilation Systems for the Atmosphere, Oceans and Land Surface (IOAS-AOLS), 91st Annual American Meteorological Society Meeting, Seattle, WA, 23-27 January 2011.

Fiorino, S.T., Randall, R.M., Krizo, M.J., Bartell, R.J., Woyak, J., and Cusumano, S.J., "Development of a High Energy Laser Tactical Decision Aid (HELTDA) for Mission Planning and Predictive Avoidance," presentation at the Directed Energy Professional Society 13th Annual DE Symposium, Bethesda MD (15-19 November 2010).

Spencer, M.F., Cusumano, S.J., Schmidt, J.D., and Fiorino, S.T., "Impact of temporal resolution on thermal blooming phase compensation instability," presentation at the Directed Energy Professional Society 13th Annual DE Symposium, Bethesda MD (15-19 November 2010).

FIORINO, STEVEN T., Department of Engineering Physics

SPONSOR FUNDED RESEARCH PROJECTS

"Modification of AFIT Atmospheric Effects Software Code for AFRL/R.Y." Sponsor: AFMC. Funding: \$105,217 – Fiorino 45%, Cusumano 45%, Randall 10%.

"CY2011 HEL JTO M&S TAWG Product Development." Sponsor: HELJTO. Funding: \$537,500 – Fiorino 55%, Cusumano 45%.

"2011 AFIT Center for Directed Energy Summer Intern (DESI) Program." Sponsor: HELJTO. Funding: \$50,000 – Fiorino 55%, Cusumano 45%.

"High Energy Laser-Joint Technology Office Contracting Officer Technical Representative." Sponsor: HELJTO. Funding: \$6,864.

"LEEDR Backscatter Code & Implementation." Sponsor: AFRL/R.Y. Funding: \$10,000.

SPONSOR FUNDED EDUCATIONAL PROJECTS

“Atmospheric Effects & Software Codes Short Course.” Sponsor: AFRL/R.Y. Funding: \$7,900 – Fiorino 95%, Randall 5%.

REFEREED JOURNAL PUBLICATIONS

Cusumano, S.J., Fiorino, S.T., Bartell, R.J., Krizo, M.J., Bailey, W.F., Beauchamp, R.L., and Marciniak, M.A., “Modeling bi-static spectral measurements of temporally evolving reflected and emitted energy from a distant and receding target,” *Journal of Applied Remote Sensing* 5, Article No. 053549, Sept 2011.

Fiorino, S.T., Randall, R.M., Bartell, R.J., Downs, A., Chu, P., and Fan, C.W., “Climate Change: Anticipated Effects on High Energy Laser Weapon Systems in Maritime Environments,” *Journal of Applied Meteorology and Climatology* 50, No. 1, pp. 153-166, Jan 2011.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Randall, R.M., Fiorino, S.T., Via, M.F., and Downs, A.D., “Validation of Technique to Hyperspectrally Characterize the Lower Atmosphere with Limited Surface Observations,” Proceedings SPIE, Vol. 8038, Article No. 803807, 2011.

BOOKS AND CHAPTERS IN BOOKS

Perram, G.P., Cusumano, S.J., Hengehold, R.L., and Fiorino, S.T., *An Introduction to Laser Weapon Systems* (Directed Energy Professional Society, Oct 2010), 463 pp.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Past President, Wright Memorial Chapter of the American Meteorological Society, 1 Oct 10 – 30 Sep 11.
Contracting Officer Representative for the Analytic Model for the Adaptive Optical Compensation for Thermal Blooming (AOTB) HELJTO BAA, 1 Oct 10 – 30 Sep 11.

Via, M.F., Randall, R.M., Fiorino, S.T., and Downs, A.D., “Surface Observations Input and Band Model Validation in LEEDR Atmospheric Characterization Package,” presented at the 33rd Review of Atmospheric Transmission Models Meeting, Lexington, MA, 15 June 2011.

Fiorino, S.T., Randall, R.M., Downs, A.D., Bartell, R.J., Krizo, M.J., and Cusumano, S.J., “Three-Dimensional Optical Turbulence Assessments from Doppler Weather Radar for Laser Applications,” presented at the 6th DEPS Systems Symposium, Monterey CA, 28 March-1 April 2011.

Beauchamp, R.L. and Fiorino, S.T., “Propagation of Laser Light Through Aero-Optical Flow: Preliminary Investigation of Moist Air with Aerosols,” presented at the 6th DEPS Systems Symposium, Monterey CA, 28 March -1 April 2011.

Fiorino, S.T., Randall, R.M., Downs, A.D., Bartell, R.J., Krizo, M.J., and Cusumano, S.J., “Three-dimensional optical turbulence assessments from doppler weather radar for laser applications” (Poster), 15th Symposium on Integrated Observing and Assimilation Systems for the Atmosphere, Oceans and Land Surface (IOAS-AOLS), 91st Annual American Meteorological Society Meeting, Seattle, WA, 23-27 January 2011.

Randall, R.M., Herman, B.M., and Fiorino, S.T., “Temporal Variability of the Atmospheric Zero Trend Level” (Poster), 23rd Conference on Climate Variability and Change, 91st Annual American Meteorological Society Meeting, Seattle WA, 23-27 January 2011.

Fiorino, S.T., Randall, R.M., Krizo, M.J., Bartell, R.J., Woyak, J., and Cusumano, S.J., "Development of a High Energy Laser Tactical Decision Aid (HELTDA) for Mission Planning and Predictive Avoidance," presented at the Directed Energy Professional Society 13th Annual DE Symposium, Bethesda MD, 15-19 November 2010.

Spencer, M.F., Cusumano, S.J., Schmidt, J.D., and Fiorino, S.T., "Impact of temporal resolution on thermal blooming phase compensation instability," presentation at the Directed Energy Professional Society 13th Annual DE Symposium, Bethesda MD (15-19 November 2010).

GROSS, KEVIN C., Department of Engineering Physics

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Palm, W.J., Marciniak, M.A., Perram, G.P., Gross, K.C., and Bailey, W.F., "Laser-induced damage of Kapton thin films demonstrating temperature and wavelength dependent absorptance: a case study in remote-sensing material analysis," Proceedings of the SPIE Laser Damage Conference, Vol. 8190, 8190-08, Sept 2011.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Palm, W.J., Marciniak, M.A., Perram, G.P., Gross, K.C., and Bailey, W.F., "Laser-induced damage of Kapton thin films demonstrating temperature and wavelength dependent absorptance: a case study in remote-sensing material analysis," presentation at the SPIE Laser Damage Conference, Boulder, CO, 18-21 Sept 2011.

Gross, K.C., Marciniak, M.A., and Perram, G.P., "Imaging Fourier Transform spectrometry as a novel tool for laser lethality," presentation at the Directed Energy Systems Symposium, Monterey, California, March 2011.

HAGER, GORDON, Department of Engineering Physics

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Jones, P., Hager, G.D., Perram, G.P., "Influence of Broadband Excitation on the Performance of Diode Pumped Alkali Laser" *42nd AIAA Plasmadynamics and Lasers Conference*, AIAA-291-4002 June 2011, Honolulu, Hawaii.

HAWKS, MICHAEL R., Lt Col, Department of Engineering Physics

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Anderson, Joel R., Hawks, Michael R., Gross, Kevin C., Perram, Glen P., "Flight test of an imaging O2(X-b) monocular passive ranging instrument," Proceedings of the SPIE, Vol. 8020, Article No. 802005, 2011.

Hawks, M., Anderson, J., Vincent, R.A., and MacDonald, D., "Range estimation from atmospheric absorption spectra," Proceedings of Military Sensing Symposium (MD-SEA), Paper No. 10-060, ED14 Orlando, FL, 2010.

HENGHOLD, ROBERT L., Department of Engineering Physics

BOOKS AND CHAPTERS IN BOOKS

Perram, G.P., Cusumano, S.J., Hengehold, R.L., and Fiorino, S.T., *An Introduction to Laser Weapon Systems* (Directed Energy Professional Society, Oct 2010), 463 pp.

HOLTGRAVE, JEREMY C., Lt Col, Department of Engineering Physics

REFEREED JOURNAL PUBLICATIONS

Miller, W.S., Sulham, C.V., Holtgrave, J.C., and Perram, G.P., "Limitations of an optically pumped rubidium laser imposed by atom recycle rate," *Applied Physics B* 103, pp. 819-824, June 2011.

MARCINIAK, MICHAEL A., Department of Engineering Physics

REFEREED JOURNAL PUBLICATIONS

Cusumano, S.J., Fiorino, S.T., Bartell, R.J., Krizo, M.J., Bailey, W.F., Beauchamp, R.L., and Marciniak, M.A., "Modeling bi-static spectral measurements of temporally evolving reflected and emitted energy from a distant and receding target," *Journal of Applied Remote Sensing* 5, Article No. 053549 (2 Sep 2011).

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Palm, W.J., Marciniak, M.A., Perram, G.P., Gross, K.C., and Bailey, W.F., "Laser-induced damage of Kapton thin films demonstrating temperature and wavelength dependent absorptance: a case study in remote-sensing material analysis," Proceedings of the SPIE Laser Damage Conference, Vol. 8190, 8190-08, Sept 2011.

Roberts, C.D., Marciniak, M.A., and Perram, G.P., "Pulsed ablation of carbon/graphite surfaces and development of plume kinetics model," Proceedings of the SPIE, Vol. 8190, 8190-31 (2011).

Vap, J.C., Nauyoks, S.E., Fitzgerald, T.M., and Marciniak, M.A., "Development of tunable polarimetric optical scattering instrument from 4.3-9.7 microns," Proceedings of the SPIE Vol. 8154, Paper No. 8154-12 (2011).

Benson, M.R., Marciniak, M.A., and Burks, J.W., "Characterization and measurements collected from Infrared Grazing Angle Reflectometer," Proceedings of the SPIE Vol. 8154, Paper No. 8154-47 (2011).

PATENTS

Hoelscher, M.G. and Marciniak, M.A., "Restoration of scene information reflected from non-specular media," USAF provisional patent application U.S. Serial No. 61/454,728, 21 March 2011.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Roberts, C.D., Marciniak, M.A., and Perram, G.P., "Pulsed ablation of carbon/graphite surfaces and development of plume kinetics model," presented at 2011 SPIE Laser Damage (8190-31), Boulder, CO, 18-21 Sept 2011.

Palm, W.J., Marciniak, M.A., Perram, G.P., Gross, K.C., and Bailey, W.F., "Laser induced damage of Kapton thin films demonstrating temperature and wavelength dependent absorptance: : a case study in remote-sensing material analysis," presented at 2011 SPIE Laser Damage (8190-31), Boulder, CO, 18-21 Sept 2011.

Vap, J.C., Nauyoks, S.E., Fitzgerald, T.M., and Marciniak, M.A., "Development of tunable polarimetric optical scattering instrument from 4.3-9.7 microns," presented at SPIE Optics & Photonics 2011 (8154-12), San Diego, CA, 21-25 Aug 2011.

Benson, M.R., Marciniak, M.A., and Burks, J.W., "Characterization and measurements collected from Infrared Grazing Angle Reflectometer," presented at SPIE Optics & Photonics 2011 (8154-47) San Diego, CA, 21-25 Aug 2011.

Nauyoks, S.E. and Marciniak, M.A., "Polarimetric scatterometry in the visible and IR," presented at the American Physical Society March 2011 Meeting, Dallas, TX, Paper No. H32.00005, 21-25 March 2011.

Vella, J., Urbas, A.M., Fitzgerald, T.M., and Marciniak, M.A., "Photo-physics of a two-photon-absorbing chromophore on sub-wavelength gold triangles," presented at the 241st American Chemical National Meeting, Anaheim, CA, 27-31 March 2011.

Gross, K.C., Marciniak, M.A., Perram, G.P., "Imaging Fourier transform spectrometry as a new tool for laser lethality," presented at the 2011 Directed Energy Systems Symposium, Monterey, CA, 28 March-1 April 2011.

Hurst, B.E., Marciniak, M.A., Perram, G.P., Gross, K.C., Bailey, W.F., Walters, C.T., "Laser damage study of painted metals at 1.07 μm ," presented at the 2011 Directed Energy Systems Symposium, Monterey, CA, 28 March-1 April 2011.

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Nauyoks, S.E., Marciniak, M.A., "MWIR and LWIR Tunable Polarimetric Scatterometry," presented at the 2011 Materials Research Society Spring Meeting (W6.3), San Francisco, CA, 25-29 April 2011.

PERRAM, GLEN P., Department of Engineering Physics

SPONSOR FUNDED RESEARCH PROJECTS

"Merging Hyperspectral Imagery and Multi-Scale Modeling for Laser Lethality." Sponsor: AFRL/RD. Funding: \$165,000 – Perram 80%, Marciniak 20%.

"High Power Diode Pumped Alkali Vapor Lasers and Analog Systems." Sponsor: AFRL/RD. Funding: \$411,336 – Perram 60%, Marciniak 20%, Gross 20%.

"Validated Atmospheric Propagation for Diode Pumped Alkali Lasers." Sponsor: HELJTO. Funding: \$70,000.

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Pitz, G.A., Fox, C.D., and Perram, G.P., "Collisional energy transfer between the cesium $6^2\text{P}_{1/2,3/2}$ levels by H_2 , HD, D_2 , CH_4 , C_2H_6 , CF_4 , and C_2F_6 " *Physical Review A* 84, Article No. 032708 (September 2011).

Miller, W.S., Sulham, C.V., Holtgrave, J.C., and Perram, G.P., "Limitations of an optically pumped rubidium laser imposed by atom recycle rate," *Applied Physics B* 103, pp. 819-824 (June 2011).

Thornton, D.E., Phillips, G.T., and Perram, G.P., "Velocity changing collisions in the laser saturation spectra of $^{87}\text{Rb } \text{D}_2 \text{ F}''=2$," *Optics Communications* 284, 2890-2894, June 2011.

Sulham, C.V., Perram, G.P., Wilkinson, M.P., and Hostutler, D.A., "A pulsed, optically pumped rubidium laser at high intensity," *Optics Communications*, Vol. 283, Pgs. 4328-4332, Nov 2010.

Pitz, G.A., Fox, C.D., and Perram, G.P., "Pressure broadening and shift of the cesium D_2 transition by the noble gases and N_2 , H_2 , HD, D_2 , CH_4 , C_2H_6 , CF_4 and ^3He with comparison to the D_1 transition," *Physical Review A*, Vol. 82, 042502, 1-9, Oct 2010.

Hager, G.D. and Perram, G.P., "A three level analytic model for alkali vapor lasers: Part I. Narrow band optical pumping," *Applied Physics B*, Vol. 101, Pgs. 45-56, Oct 2010.

Sulham, C.V., Pitz, G.A., and Perram, G.P. "Blue alkali lasers pumped by two photon absorption" *Applied Physics B*, Vol. 101, Pgs. 57-63, Oct 2010.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Gallagher, J.A. and Perram, G.P., "Two-Photon Pumped Alkali Lasers" 42nd *AIAA Plasmadynamics and Lasers Conference*, AIAA-2011-4005 June 2011, Honolulu, Hawaii.

Brown, Kirk A., Hurd, Edward J., and Perram, Glen P., "Stimulated Raman Scattering in Pulsed Excitation of Potassium" 42nd *AIAA Plasmadynamics and Lasers Conference*, AIAA-2011-3458 June 2011, Honolulu, Hawaii.

Jones, P., Hager, G.D., and Perram, G.P., "Influence of Broadband Excitation on the Performance of Diode Pumped Alkali Laser" 42nd *AIAA Plasmadynamics and Lasers Conference*, AIAA-291-4002 June 2011, Honolulu, Hawaii.

Steward, B.J., Gross, K.C., and Perram, G.P., "Optical Characterization of Artillery Blast Waves," *Defense Security Symposium*, Vol. 8020, 80200D doi:10.117/12.883524 Orlando, Florida, April 2011, Orlando, FL.

Anderson, Joel R., Hawks, Michael R., Gross, Kevin C., and Perram, Glen P., "Flight test of an imaging O2 (X-b) monocular passive ranging instrument," *Proc. SPIE*, Vol. 8020, pp. 802005 (2011). <http://dx.doi.org/10.1117/12.883484>.

Gordon, Joe Motos, Gross, Kevin C., and Perram, Glen P., "Empirical model for the temporally resolved temperatures of post-detonation fireballs for aluminized high explosives," *Proc. SPIE*, Vol. 8018, pp. 80181M (2011). <http://dx.doi.org/10.1117/12.883515>.

Rice, C.A. and Perram, G.P., "A tunable diode laser absorption system for long path atmospheric transmission and high energy laser applications." *Photonics West, SPIE* Vol. 7924, Article No. 7924-19, Jan 2011, San Francisco, California.

Brown, K.C., and Perram, G.P., "Cesium laser operating in the blue by direct optical excitation of the 7 2P_{3/2} state," *Photonics West, SPIE* Vol. 7915, Article No. 7915-6, Jan 2011, San Francisco, California.

Anderson, M.D., and Perram, G.P., "Tunable optical delay hole burning and ground state depletion effects in cesium vapor" *Photonics West, SPIE* Vol. 7949, Article No. 7949-29, Jan 2011, San Francisco, California.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Roberts, C.D., Marciniak, M.A., Perram, G.P., Huegen, T., "Pulsed ablation of carbon/graphite surfaces and development of plume-kinetics model," presentation at the *SPIE Laser Damage*, 18-21 Sept 2011, Boulder, CO.

Palm, W.J., Marciniak, M.A., Perram, G.P., Gross, K.C., Bailey, W.F., "Laser-induced damage of Kapton thin films demonstrating temperature and wavelength dependent absorptance: a case study in remote-sensing material analysis," presentation at the *SPIE Laser Damage*, 18-21 Sept 2011, Boulder, CO.

Gross, K.C., Marciniak, M.A., Perram, G.P., "Imaging Fourier Transform spectrometry as a novel tool for laser lethality," presentation at the *Directed Energy Systems Symposium*, Directed Energy Professional Society, March 2011, Monterey, California.

Palm, W.J., Marciniak, M.A., Perram, G.P., "Multilayer insulation laser damage characterization for wavelength scaling," presentation at the *Directed Energy Systems Symposium*, Directed Energy Professional Society, March 2011, Monterey, California.

Hurst, B., Marciniak, M.A., Perram, G.P., “Laser-damage study of painted metals at 1.07 μ m,” presentation at the *Directed Energy Systems Symposium*, Directed Energy Professional Society, March 2011, Monterey, California.

Hurd, E.J., Holtgrave, J., Perram, G.P., “Characteristics of a High-Intensity, Pulsed, Potassium Vapor Laser,” presentation at the *13th Annual Directed Energy Symposium*, Nov 2010, Bethesda, MD.

Pitz, G.A., Fox, C.D., Perram, G.P., “Collisional Energy Transfer between the cesium 6²P_{1/2,3/2} levels by H₂, HD, D₂, CH₄, C₂H₆, CF₄, and C₂F₆,” presentation at the *13th Annual Directed Energy Symposium*, Nov 2010, Bethesda, MD.

Rice, C.A., Perram, G.P., “A preliminary study of atmospheric propagation for potassium DPAL HEL systems with atmospheric oxygen using a rugged TDLAS system,” presentation at the *13th Annual Directed Energy Symposium*, Nov 2010, Bethesda, MD.

RANDALL, ROBB M., Lt Col, Department of Engineering Physics

REFEREED JOURNAL PUBLICATIONS

Fiorino, S.T., Randall, R.M., Bartell, R.J., Downs, A., Chu, P., and Fan, C.W., “Climate Change: Anticipated Effects on High Energy Laser Weapon Systems in Maritime Environments,” *Journal of Applied Meteorology and Climatology* 50, No. 1, pp. 153-166, Jan 2011.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Randall, R.M., S.T. Fiorino, M.F. Via, and A.D. Downs, “Validation of Technique to Hyperspectrally Characterize the Lower Atmosphere with Limited Surface Observations,” *Proceedings SPIE*, Vol. 8038, Article No. 803807 (2011)

SCHMIDT, JASON D., Maj, Department of Electrical and Computer Engineering

SPONSOR FUNDED RESEARCH PROJECTS

“Material Characterization of an Unknown Object Using Passive Remote Sensing.” Sponsor: AFOSR. Funding: \$23,920.

“Integrated Approach to Free-Space Optical Communications.” Sponsor: AFOSR. Funding: \$9,920.

“Phase Unwrapping in Strong Turbulence.” Sponsor: AFOSR. Funding: \$33,000.

“Advanced Wavefront Estimation in Strong Turbulence.” Sponsor: AFOSR. Funding: \$99,656.

WEEKS, DAVID E., Department of Engineering Physics

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Blank, L.A., Weeks, D.E., and Kedziora, G.S., “Potential Energy Surfaces of M+Ng, M = K, Rb, Cs, and Ng = He, Ne, Ar,” presented at the 66th International Symposium on Molecular Spectroscopy, Columbus, OH, 20-24 June 2011.

Weeks, D.E., Belcher, L.T., Blank, L.A., and Kedziora, G.S., “Potential Energy Surfaces and Derivative Coupling Terms for M+Ng, M = K, Rb, Cs, and Ng = He, Ne, Ar,” presented at the Spring 2011 Meeting of the Ohio-Region Section of the APS, University Heights, OH, 15-16 April 2011.

Weeks, D.E. and Barger, L.A., "Scattering Matrix Elements for the Non-Adiabatic B+H₂ Collision," presented at the Fall 2010 Meeting of the Ohio-Region Section of the APS, Marietta, OH, 8-9 October 2010.

6.4. CENTER FOR TECHNICAL INTELLIGENCE STUDIES AND RESEARCH

Center for Technical Intelligence Studies and Research (CTISR)

Director 255-3636 x4536

Executive Program Coordinator 255-7287

FAX 656-6000

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

6.4.1 DOCTORAL DISSERTATIONS

GORDON, JOE M., *Shock Wave Dynamics of Novel Aluminized Detonations and Empirical Model for Temperature Evolution from Post-Detonation Combustion Fireballs*. AFIT/DS/ENP/10-S03. Faculty Advisor: Dr. Glen P. Perram. Sponsor: DTRA.

6.4.2 MASTER'S THESES

HARLEY, JACOB L., *Remote Quantification of Smokestack Total Effluent Mass Flow Rates Using Imaging Fourier-Transform Spectroscopy*. AFIT/GAP/ENP/11-M01. Faculty Advisor: Dr. Kevin C. Gross. Sponsor: NASIC.

MASSMAN, JENNIFER L., *Understanding the Influence of Turbulence in Imaging Fourier-Transform Spectrometry of Smokestack Plumes*. AFIT/GAP/ENP/11-M05. Faculty Advisor: Dr. Kevin C. Gross. Sponsor: N/A.

VINCENT, ROBERT A., *Passive Ranging of Dynamic Rocket Plumes using Infrared and Visible Oxygen Attenuation*. AFIT/GAP/ENP/11-M11. Faculty Advisor: Lt Col Michael R. Hawks. Sponsor: NASIC.

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

Borel, Christoph C. and Tuttle, Ronald F., "Multi- and hyperspectral scene modeling," Proceedings of the SPIE, Vol. 7812, 78120K, 2011.

Borel, Christoph C., "Vegetative canopy parameter retrieval using 8-band data," Proceedings of the 2011 Geospatial World Forum, Hyderabad, India, 21 pages, 18-21 Jan 2011.

Borel, C. and Bunker, D., "Multi-spectral vegetative canopy parameter retrieval," Proceedings of the SPIE Remote Sensing, Vol. 8174, paper #32, 12 pages, Sept 2011.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Borel, Christoph C., "Vegetative canopy parameter retrieval using 8-band data," presentation at the 2011 Geospatial World Forum, Hyderabad, India, Conference Proc., 18-21 Jan 2011.

Borel, Christoph C. and Tuttle, Ronald F., "Simulation of sub-pixel thermal target detection," presentation at the IEEE Aerospace Conference, Big Sky, 5-12 March 2011.

Borel, Christoph C. and Tuttle, Ronald F., "Recent advances in temperature emissivity separation algorithms," presentation at the IEEE Aerospace Conference, Big Sky, 5-12 March 2011).

Borel, Christoph C., "Methods to find sub-pixel targets in hyperspectral data," presentation at the WHISPERS 2011, Lisbon, IEEE, June 2011.

Borel, C., and Bunker, D., "Multi-spectral vegetative canopy parameter retrieval," presentation at the SPIE Remote Sensing, paper #32, Prague, Czech Republic, 19-22 September 2011.

Borel, C., Bunker, D., Walford, G., Magnus, A., Miller, L., and Tuttle, R., "Rapid Location Of Radiation Sources In Complex Environments Using Optical And Radiation Sensors," presentation at the 4th CBRNE Research & Education Collaboration Symposium, Fairborn, Ohio, 21-23 Sep 2011.

BUNKER, DAVID J., Department of Engineering Physics

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Borel, C. and Bunker, D., "Multi-spectral vegetative canopy parameter retrieval," Proceedings of the SPIE Remote Sensing, Vol. 8174, paper #32, 12 pages, September 2011.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Borel, C., and Bunker, D., "Multi-spectral vegetative canopy parameter retrieval," presentation at the SPIE Remote Sensing, paper #32, Prague, Czech Republic, 19-22 September 2011.

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GROSS, KEVIN C., Department of Engineering Physics

SPONSOR FUNDED RESEARCH PROJECTS

"NASIC Ground Truth Support." Sponsor: NASIC. Funding: \$140,000 – Gross 80%, Perram 10%, Tuttle 10%.

REFEREED JOURNAL PUBLICATIONS

Gross, K.C., Bradley, K.C., Perram, G.P., "Remote identification and quantification of industrial smokestack effluents via imaging Fourier-transform spectroscopy," *Environmental Science and Technology*, Vol. 44, pp. 9390-9397, Nov 2010.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Harley, Jacob L. and Gross, Kevin C. "Remote quantification of smokestack effluent mass flow rates using imaging Fourier-transform spectrometry," Proceedings of the SPIE, Vol. 8018, Article No. 801813, 2011. <http://dx.doi.org/10.1117/12.883193>.

Anderson, Joel R., Hawks, Michael R., Gross, Kevin C., Perram, Glen P., "Flight test of an imaging O2 (X-b) monocular passive ranging instrument," Proceedings of the SPIE, Vol. 8020, Article No. 802005, 2011. <http://dx.doi.org/10.1117/12.883484>.

Gordon, Joe Motos, Gross, Kevin C., Perram, Glen P., "Empirical model for the temporally resolved temperatures of post-detonation fireballs for aluminized high explosives," Proceedings of the SPIE, Vol. 8018, Article No. 80181M, 2011. <http://dx.doi.org/10.1117/12.883515>.

Steward, Bryan J., Gross, K., and Perram, Glen P., "Reduction of optically observed artillery blast wave trajectories using low dimensionality models," Proceedings of the SPIE, Vol. 8020, pp. 80200D, 2011. <http://dx.doi.org/10.1117/12.883524>.

Steward, Bryan J., Gross, Kevin C., Perram, Glen P., "Optical Characterization of Artillery Blast Waves," *Defense Security Symposium*, Vol. 8020, Article No. 80200D, April 2011. <http://doi:10.1117/12.883524>

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Steward, Bryan J., Gross, Kevin C., and Perram, Glen P., "Optical Characterization of Artillery Blast Waves," presentation at the Defense Security Symposium, Orlando, Florida, April 2011.

HAWKS, MICHAEL R., Lt Col, Department of Engineering Physics

SPONSOR FUNDED RESEARCH PROJECTS

"Enhanced Monocular Passive Ranging Methods." Sponsor: NASIC. Funding: \$36,500.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Vincent, R.A. and Hawks, M., "Passive ranging of dynamic rocket plumes using infrared and visible oxygen attenuation," Proceedings of the SPIE, Vol. 8052, Article No. 80520D, 2011.

MAGNUS, AMY L., Department of Engineering Physics

SPONSOR FUNDED RESEARCH PROJECTS

"3D Site and Feature Models for a Physics Based Approach to Wide Area Sense Making." Sponsor: AFRL/RV. Funding: \$122,669 – Magnus 37%, Walli 37%, Jackson 10%, Bunker 6%, Borel-Donohue 10%.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Borel, C., Bunker, D., Walford, G., Magnus, A., Miller, L., and Tuttle, R., "Rapid Location Of Radiation Sources In Complex Environments Using Optical And Radiation Sensors," presentation at the 4th CBRNE Research & Education Collaboration Symposium, Fairborn, Ohio (21-23 Sep 2011).

PERRAM, GLEN P., Department of Engineering Physics

REFEREED JOURNAL PUBLICATIONS

Gross, K.C., Bradley, K.C., and Perram, G.P., "Remote identification and quantification of industrial smokestack effluents via imaging Fourier-transform spectroscopy," *Environmental Science and Technology*, Vol. 44, Pgs. 9390-9397, Nov 2010.

TUTTLE, RONALD F., Department of Engineering Physics

SPONSOR FUNDED RESEARCH PROJECTS

"Chief Technology Officer (CTISR)." Sponsor: AFRL/RV. Funding: \$28,000.

"RV Phenomenologies Support: Phase II." Sponsor: NASIC. Funding: \$82,899 – Tuttle 10%, Bunker 70%, Garvin 20%.

"ARL Technical Assistance Program (ATAP)." Sponsor: ARL. Funding: \$15,000 – Tuttle 15%, Borel-Donohue 85%.

SPONSOR FUNDED EDUCATIONAL PROJECTS

“CEH Course.” Sponsor: NASIC. Funding: \$56,419 – Tuttle 50%, Bunker 50%.

“Project Pegasus.” Sponsor: AFIAA. Funding: \$232,585 – Tuttle 50%, Bunker 50%.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Christoph C. Borel and Ronald F. Tuttle, “Simulation of sub-pixel thermal target detection,” IEEE Aerospace Conference, Big Sky March 5-12, (2011).

Christoph C. Borel and Ronald F. Tuttle, “Recent advances in temperature emissivity separation algorithms,” IEEE Aerospace Conference, Big Sky March 5-12, (2011).

Christoph C. Borel and Ronald F. Tuttle, “Multi- and hyperspectral scene modeling,” Proc. SPIE 7812, 78120K, (2011) .

Borel, C., Bunker, D., Walford, G., Magnus, A., Miller, L., and Tuttle, R., "Rapid Location Of Radiation Sources In Complex Environments Using Optical And Radiation Sensors," 4th CBRNE Research & Education Collaboration Symposium, Fairborn, Ohio, 21-23 Sep 2011.

WALLI, KARL C., Lt Col, Department of Engineering Physics

SPONSOR FUNDED RESEARCH PROJECTS

“OPIR Algorithm Assessment.” Sponsor: AFSPC. Funding: \$65,000 – Walli 60%, Bunker 40%.

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

BEDNAR, EARL M., *Identification and Classification of Player Types in Massive Multiplayer Online Games Using Avatar Behavior*. AFIT/DS/ENS/11S-01. Faculty Advisor: Dr. John O. Miller. Sponsor: HQ USAF/A9.

RYER, DAVID M., *Quest Hierarchy for Hyperspectral Face Recognition*. AFIT/DS/ENS/10-03. Faculty Advisor: Dr. Kenneth W. Bauer. Sponsor: AFRL/RV.

6.5.2 MASTER'S THESES

ALZBEN, MOHAMMED I., *The Impact of Environmental Factors on Internal Integration in Support of Supply Chain Management*. AFIT/LSCM/ENS/11-01. Faculty Advisor: Lt Col Doral E. Sandlin. Sponsor: Saudi Arabia's Ministry of Defense and Aviation.

BUCHHEIT, ERIC W., *Optimizing Ground Times for AMC Aircraft in Afghanistan*. AFIT/OR/MS/ENS/11-02. Faculty Advisor: Dr. James T. Moore. Sponsor: AMC/A9.

CAMMARANO, VINCENT R., *Estimating Cargo Airdrop Collateral Damage Risk*. AFIT/LSCM/ENS/11-02. Faculty Advisor: Dr. Jeffery K. Cochran. Sponsor: AMC/A2.

CHUA, MICHAEL E., *A Simulation of the ECSS Help Desk with the Erlang A Model*. AFIT/GCA/ENS/11-01. Faculty Advisor: Dr. Jeffrey A. Ogden. Sponsor: HQ USAF/A4.

DAVIS, KRISTI R., *Verification and Validation of Component Cost Assessment Program (CCAP)*. AFIT/OR/MS/ENS/11-03. Faculty Advisor: Lt Col Stephen P. Chambal. Sponsor: AFRL/RZ.

DEGENHARDT, MARK A., *Metric Development for Continuous Process Improvement*. AFIT/OR/MS/ENS/11-04. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: ACC/A9.

DICKENS, JOHN M., *Central Command Rest and Recuperation Hub-to-Hub Airlift Network Analysis*. AFIT/LSCM/ENS/11-03. Faculty Advisor: Dr. Pamela S. Donovan. Sponsor: AMC/A9.

DURKAN, MEHMET, *Multi Objective Decision Analysis for Assignment Problems*. AFIT/OR/MS/ENS/11-05. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: TuAF.

GAGE, HARMON J.A., *Using Upper Layer Weights to Efficiently Construct and Train Feedforward Neural Networks Executing Backpropagation*. AFIT/OR/MS/ENS/11-06. Faculty Advisor: Dr. Kenneth W. Bauer. Sponsor: NASIC.

GOMES, KESIA G., *A Comparative Study Between U.S. and Brazilian Acquisition Regulations and Practices*. AFIT/LSCM/ENS/11-04. Faculty Advisor: Dr. Jeffrey A. Ogden. Sponsor: N/A.

HAASE, CASEY L., *Tailoring the Statistical Experimental Design Process for LVC Experiments*. AFIT/GOR/ENS/11-07. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: ASC.

HACKLEMAN, ANDREW S., *Nuclear Enterprise Performance Measurement*. AFIT/LSCM/ENS/11-05. Faculty Advisor: Dr. Alan W. Johnson. Sponsor: AFMC/OV.

HAMILTON, JASON S., *Determining Pilot Manning for Bomber Longevity*. AFIT/OR/MS/ENS/11-08. Faculty Advisor: Dr. James W. Chrissis. Sponsor: 509 OG.

HOSKET, JONATHON S., *A Methodology Using Simulation Results for Test and Evaluation*. AFIT/OR/MS/11-09. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: N/A.

JONES, DUSTIN P., *Optimal CH-47 and C-130 Workload Balance*. AFIT/OR/MS/ENS/11-10. Faculty Advisor: Dr. James T. Moore. Sponsor: AMC/A9.

JOYNER, GARDER J., *Measure of Effectiveness for JSTARS Ground Moving Target Indicator: A Value Focused Thinking Approach*. AFIT/OR/MS/ENS/11-11. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: DIA.

JUNG, SUNGTAE, *Improving Way of Logistics Management in Korean Army*. AFIT/LSCM/ENS/11-06. Faculty Advisor: Dr. William A. Cunningham. Sponsor: ROKA.

LEGUIZA, FRANCISCO E., *By Product Synergy Analysis*. AFIT/LSCM/ENS/11-08. Faculty Advisor: Lt Col Timothy J. Pettit. Sponsor: HQ AFMC.

LICKLIDER, CHRISTY A.R., *A Meta-Analysis of the Antecedents of Voluntary Turnover in Studies Involving Active Duty Military Member Populations*. AFIT/GEM/ENS/11-01. Faculty Advisor: Lt Col Sharon G. Heilmann. Sponsor: N/A.

MALYEMEZ, CEM, *Multi Criteria Decision Support Model for the Turkish Air Force Personnel Course/ Education Planning System*. AFIT/OR/MS/ENS-11-12. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: TuAF.

MELIN, MEGAN P., *Modeling and Analysis of High Energy Laser Weapon System Performance in Varying Atmospheric Conditions*. AFIT/OR/MS/ENS/11-27. Faculty Advisor: Dr. John O. Miller. Sponsor: AFRL/RD. [COA & CDE]

MERRITT, KASSANDRA M., *Coverage of Continuous Regions in Euclidean Space using Homogeneous Resources with Application to the Allocation of the Phased Array Radar Systems*. AFIT/GA/ENC/11-01. Faculty Advisor: Lt Col Karen E. Dillard. Sponsor: USNORTHCOM.

MESSER, ADAM J., *Contextual Detection of Anomalies in Hyperspectral Images*. AFIT/OR/MS/ENS/11-15. Faculty Advisor: Dr. Kenneth W. Bauer. Sponsor: NASIC.

MOHD-ZAID, MOHD FARUL, *Face Recognition via Ensemble Sift Matching of Uncorrelated Hyperspectral Bands and Spectral PCTS*. AFIT/OR/MS/ENS/11-16. Faculty Advisor: Dr. Kenneth W. Bauer. Sponsor: AFRL/RD.

PRUITT, JAMES L., *Decision Analysis and Validation of Value Focused Thinking Decision Models Using Multivariate Analysis Techniques*. AFIT/OR/MS/ENS/11-17. Faculty Advisor: Dr. Kenneth W. Bauer. Sponsor: AFMC/A9.

QUASHNE, MICHAEL R., *Application of Post Modern Portfolio Theory to Mitigate Risk in International Shipping*. AFIT/OR/MS/ENS-11-18. Faculty Advisor: Dr. James T. Moore. Sponsor: AMC/A9.

SCHMIDT, AMY L., *Alternative Active Duty Military Retirement Plan*. AFIT/GCA/ENS/11-02. Faculty Advisor: Dr. William A. Cunningham. Sponsor: HQ AFPC.

SPRINGSTON, JAMES J., *Determining the Value of Future Information*. AFIT/OR/MS/ENS/11-20. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: DIA.

STACK, DONALD A., *Impact of Coalition Requirements on Transportation*. AFIT/OR/MS/ENS/11-21. Faculty Advisor: Dr. James T. Moore. Sponsor: USTRANSCOM.

SWEARINGEN, ROBERT J., *Understanding Evolved Expendable Launch Vehicle Capacity using an Arena Discrete-Event Simulation Model*. AFIT/OR/MS/ENS/11-22. Faculty Advisor: Lt Col Stephen P. Chambal. Sponsor: OSD.

TALAFUSE, THOMAS P., *Empirical Characterization of Ballistic Impact Flash*. AFIT/OR/MS/ENS/11-23. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: 46 TG.

TURNQUIST, BROOKS R., *Fusion Schemes for Ensembles of Hyperspectral Anomaly Detection Algorithms*. AFIT/OR/MS/ENS/11-25. Faculty Advisor: Dr. Kenneth W. Bauer. Sponsor: NASIC.

YEE, FLORENCE K., *Depot-Level Simulation and Multivariate Analysis on B-1 High Velocity Maintenance*. AFIT/OR/MS/ENS/11-26. Faculty Advisor: Dr. John O. Miller. Sponsor: 591 SCMG.

YSEBAERT, STEPHANIE C., *An Analytical Approach to Low Observable Maintenance Practices using Simulation and Marginal Analysis*. AFIT/OR/MS/ENS/11-19. Faculty Advisor: Dr. Alan W. Johnson. Sponsor: ASC.

6.5.3 GRADUATE RESEARCH PAPERS

AXTELL, PETER G., *Value Focused Thinking Analysis of the Pacific Theater's Future Air Mobility En Route System*. AFIT/IMO/ENS/11-01. Faculty Advisor: Lt Col Joseph B. Skipper. Sponsor: HQ AMC.

BENTLEY, CASSIUS T., *Market Opportunity Analysis: Afghanistan Direct Delivery Strategic Opportunities*. AFIT/IMO/ENS/11-02. Faculty Advisor: Lt Col Doral E. Sandlin. Sponsor: HQ AMC.

BENTON, TERECA V., *Data Envelopment Analysis to Assess Productivity in the United States Air Force Medical Supply Chain*. AFIT/ILS/ENS/11-01. Faculty Advisor: Lt Col Joseph B. Skipper. Sponsor: AFMOA.

BLAND, MATTHEW G., *The Impact of CRAF Activation Risk on Long-Run International Routes*. AFIT/IMO/ENS/11-03. Faculty Advisor: Dr. Pamela S. Donovan. Sponsor: HQ AMC.

COOLEY, HEATHER D., *C-130 Programmed Depot Maintenance Processes*. AFIT/ILS/ENS/11J-02. Faculty Advisor: Dr. Alan W. Johnson. Sponsor: HQ AFMC.

FARRELL, PATRICK F., *Remotely Piloted Aircraft (RPA) Performing the Airdrop Mission*. AFIT/IMO/ENS/11-04. Faculty Advisor: Lt Col Joseph B. Skipper. Sponsor: HQ AMC.

GHAJ, RACHEL, *A Taxonomy for Insourcing in the Aerospace Industry*. AFIT/ILS/ENS/11-12. Faculty Advisor: Lt Col Timothy J. Pettit. Sponsor: N/A.

GILBERT, RONALD E., *Strategic Implications of US Fighter Force Reductions: Air-to-Air Combat Modeling Using Lanchester Equations*. AFIT/IOA/ENS/11-01. Faculty Advisor: Dr. John O. Miller. Sponsor: ACC/433 WPS.

HANFORD, JAMES R., *Effects of Contoured Pallets on AMC Mission Efficiency*. AFIT/IMO/ENS/11-05. Faculty Advisor: Dr. James T. Moore. Sponsor: HQ AMC.

HUGHES, JAROD C., *Direct Support of War Fighting Forces Using Apportioned Airlift*. AFIT/ILS/ENS/03-11. Faculty Advisor: Lt Col Joseph B. Skipper. Sponsor: HQ AMC.

JENSEN, TODD M., *The Impact of Coalition Movements on Airlift Projections*. AFIT/ILS/ENS/11-04. Faculty Advisor: Dr. William A. Cunningham. Sponsor: US TRANSCOM.

KLEIV, DAIN O., *Examination of Air Force Crash Damaged or Disabled Aircraft Recovery Program Resourcing*. AFIT/ILS/ENS/11-05. Faculty Advisor: Dr. William A. Cunningham. Sponsor: HQ USAF/A4.

LAROSE, AARON J., *Utilization of Decision Analysis for Service Member Retirement Options*. AFIT/IOA/ENS/11-02. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: N/A.

LESINKSI, WALTER J., III, *Tankering Fuel: A Cost Saving Initiative*. AFIT/IMO/ENS/11-06. Faculty Advisor: Dr. Alan W. Johnson. Sponsor: HQ AMC.

LINCK, SCOTT C., *Tanker Fuel Consolidation: Impact of Fuel Efficiency on ATO Resiliency*. AFIT/IMO/ENS/11-07. Faculty Advisor: Dr. Alan W. Johnson. Sponsor: HQ AMC.

LLANTADA, RONALD, *The Effects of Employing HVM on C-130 Aircraft at WR-ALC to Aircraft Availability*. AFIT/ILS/ENS/11-06. Faculty Advisor: Dr. William A. Cunningham. Sponsor: N/A.

LYNCH, PHILIP W., *Hybrid Airships: Intratheater Operations Cost-Benefit Analysis*. AFIT/IMO/ENS/11-08. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: USTRANSCOM.

MARKWART, TODD C., *A Study in Sea-Air Intermodal Port Selection: Strategic Decision Making for United States Southern Command*. AFIT/ILS/ENS/11-07. Faculty Advisor: Dr. Jeffery D. Weir. Sponsor: USTRANSCOM.

MAYER, BRIAN P., *Contingency Response Groups: An Analysis of Maintenance Training*. AFIT/IMO/ENS/11-09. Faculty Advisor: Dr. William A. Cunningham. Sponsor: N/A.

MCNEAL, TODD E., *Civil Reserve Air Flight - 60/40 Rule: The Case for a Reinstatement using Block Hours*. AFIT/IMO/ENS/11-10. Faculty Advisor: Dr. Pamela S. Donovan. Sponsor: HQ AMC.

MIRTICH, JOHN M., *Cost Index Flying*. AFIT/IMO/ENS/11-11. Faculty Advisor: Lt Col Doral E. Sandlin. Sponsor: HQ AMC.

MORISSETTE, GREGORY A., *Developing a Predictive Model for Facility Repair Costs on United States Air Force Installations*. AFIT/ILS/ENV/11J-01. Faculty Advisor: Dr. Alfred E. Thal. Sponsor: HQ USAF/A7.

MUSE, YIRA Y., *Use of Informal Networks to Resolve Logistics-related Issues in Humanitarian Assistance/Disaster Response*. AFIT/ILS/ENS/11-09. Faculty Advisor: Lt Col Sharon G. Heilmann. Sponsor: N/A.

OLSEN, CHRISTOPHER M., *Simulation Study of Evacuation Control Center Operations Analysis*. AFIT/IOA/ENS/11-04. Faculty Advisor: Dr. John O. Miller. Sponsor: EUCOM.

SCHEER, MARK A., *Noncombatant Evacuation Operations in USEUCOM*. AFIT/IOA/ENS/11-05. Faculty Advisor: Dr. John O. Miller. Sponsor: EUCOM.

SHEA, PHILLIP A., *Sea-Air Intermodal Port Pair Selection Criteria in South America*. AFIT/IMO/ENS/11-12. Faculty Advisor: Lt Col Doral E. Sandlin. Sponsor: USTRANSCOM.

SPERRY, THARON, *Delphic Analytic Hierarchy Goal Programming Process (A Multiple Goal, Multiple Objective Decision Making Approach): Case Study Political Decision Making on the African Airlift Partnership*. AFIT/IMO/ENS/11-13. Faculty Advisor: Dr. James T. Moore. Sponsor: SAF/IA.

TRICHE, WILLIAM P., *Dual Role Airlift: Fee for Service?* AFIT/IMO/ENS/11-14. Faculty Advisor: Dr. William A. Cunningham. Sponsor: HQ AMC.

UNDERWOOD, KENNETH D., *Minimizing the Risks of Diminishing Manufacturing Sources and Material Shortages: Evaluating Electronic Avionics Lifecycle Sustainment Strategies*. AFIT/ILS/ENS/11-10. Faculty Advisor: Dr. Jeffrey A. Ogden. Sponsor: N/A.

VANN, MATTHEW T., *C-5 Channel Delays: Analysis of Potential Causal Factors*. AFIT/IMO/ENS/11-15. Faculty Advisor: Dr. James T. Moore. Sponsor: HQ AMC.

WAHOSKE, TED A., *Cost Effectiveness Approach to B-1B Consumable and Repairable Procurement Strategies*. AFIT/ILS/ENS/11-11. Faculty Advisor: Dr. John O. Miller. Sponsor: AFGLSC.

WILSON, JAMES G., *Examining the Statistical Rigor of Test and Evaluation Results in the Live, Virtual and Constructive Environment*. AFIT/IOA/ENS/11-06. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: OSD.

WILSON, SANDRA J., *The Impact of Increased Pallet Utilization on Intra-Theater Airlift*. AFIT/IMO/ENS/11-16. Faculty Advisor: Dr. James T. Moore. Sponsor: HQ 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., LTC, Department of Operational Sciences

SPONSOR FUNDED RESEARCH PROJECTS

“A System of Equations to Capture SSTRO Dynamics.” Sponsor: US Army. Funding: \$200,000 – Ahner 60%, Deckro 20%, Chrissis 20%.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Hackleman, A., Johnson, A., and Ahner, D. “Nuclear Enterprise Performance Measurement,” Proceedings of the IIE Industrial Engineering Research Conference, Reno, NV, 22-24 May 2011.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Carl Parson and LTC Darryl Ahner, “Individual Deployer Personnel Analysis,” 79th Military Operations Research Society Symposium, Monterey, CA, June 2011. Presented in WG 18 – Manpower and Personnel & WG 19 -Readiness.

Carl Parson and LTC Darryl Ahner, “Individual Deployer Personnel Analysis,” 79th Military Operations Research Society Symposium, Monterey, CA, June 2011. Presented in WG 18 – Manpower and Personnel & WG 19 -Readiness.

MAJ Cade Saie and LTC Darryl Ahner, “Capturing the Interrelated Dynamics of Security, Stability, Transition and Reconstruction Operations” 79th Military Operations Research Society Symposium, Monterey, CA, June 2011. Presented in WG 10 – Joint Campaign Analysis & WG 22 – Measures of Merit.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Invited speaker, “A Practical Approach to Dynamic Programming,” 79th MORSS Tutorial, Monterey, CA, 20 June 2011.

BAKER, WILLIAM P., Department of Mathematics and Statistics

SPONSOR FUNDED RESEARCH PROJECTS

“Pulse Forensics Enhanced Real-time De-interleaving (HORSE).” Sponsor: AFRL/R.Y. Funding: \$30,000 – Baker 51%, Oxley 49%.

BAUER, KENNETH W., Department of Operational Sciences

SPONSOR FUNDED RESEARCH PROJECTS

“Advanced Research in Automatic Target Recognition.” Sponsor: NASIC. Funding: \$200,000.

REFEREED JOURNAL PUBLICATIONS

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 21, 2011, 1548512911403520, first published on April 21, 2011 doi:10.1177/1548512911403520.

Leap, N. J. and Bauer, K. W., “A confidence paradigm for classification systems.” Naval Research Logistics (NRL), Vol. 58, Issue 3, pp. 165-321, April 2011, n/a. doi: 10.1002/nav.20426.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Ryer, D., Bihl, T., Bauer, K., and Rogers, S., “QUEST hierarchy for hyperspectral face recognition,” SPIE Defense and Security Symposium, April 25-29, 2011, Orlando, FL.

Mindrup, F., Friend, M., Bauer, K., “Selecting training and test images for optimized anomaly detection and material identification algorithms in hyperspectral imagery through robust parameter design,” SPIE Defense and Security Symposium, April 25-29, 2011, Orlando, FL.

Mindrup, F., Bihl, T., and Bauer, K., "Modeling Noise in a Framework to Optimize the Detection of Anomalies in Hyperspectral Imaging," Artificial Neural Networks in Engineering Conference, Nov. 2010, Vol. 20, pages 517-524.

Williams, J., Bihl, T., and Bauer, K., "Mitigation of Correlation and Heterogeneity Effects in Hyperspectral Data," Artificial Neural Networks in Engineering Conference, Nov. 2010, Vol. 20, pages 501-507.

CHAMBAL, STEPHEN P., Lt Col, Department of Operational Sciences

SPONSOR FUNDED RESEARCH PROJECTS

“AFIT/ENS Support to the Air Force Applications Center.” Sponsor: AFTAC. Funding: \$5,200.

SPONSOR FUNDED EDUCATIONAL PROJECTS

“AF/A9 Combat Analyst Course Consultation (Revised).” Sponsor: HQ USAF. Funding: \$18,312.

“DOE Education Support for AFRL/R.Y.” Sponsor: AFRL/R.Y. Funding: \$5,000.

CHRISSIS, JAMES W., Department of Operational Sciences

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

J. Hamilton and J. Chrissis, "Determining Pilot Manning for Bomber Longevity," WG-18, 79th MORSS, Monterey, CA, 23 June 2011.

COCHRAN, JEFFERY K., Department of Operational Sciences

REFEREED JOURNAL PUBLICATIONS

Broyles, J.R., Cochran, J.K., and Montgomery, D.C., "A Statistical Markov Chain Approximation of Transient Hospital Inpatient Inventory," *European Journal of Operations Research* 207:3, pp. 1645-1657 (Nov 2010).

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Cochran, J.K. and Burdick, T.L., "The Impact of the Door-to-Doc Emergency Department Patient Flow Model," IIE Industrial Engineering Research Conference, Paper 610 (6 pages) on CD-ROM, Reno, NV (May 2011).

CUNNINGHAM, WILLIAM A., Department of Operational Sciences

SPONSOR FUNDED RESEARCH PROJECTS

"Leading Edge Supply Chain: Identifying Ways to Improve Weapon System Sustainment and Logistics Support." Sponsor: AFRL/RX. Funding: \$300,000 – Cunningham 25%, Skipper 50%, Donovan 25%.

REFEREED JOURNAL PUBLICATIONS

John E. Bell, Stanley Griffis, William A. Cunningham III, Jon A. Eberlan, "Location Optimization of Strategic Alert Sites for Homeland Defense," *Omega*, 39 (2011), pp. 151-158.

Skipper, Joseph B., John E. Bell, William A. Cunningham, and Daniel D. Mattioda (2010), "Forward Positioning and Consolidation of Strategic Inventories," *Journal of Transportation Management*, Vol. 21, No. 1, pp. 27-41.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

John Bell, Joseph Skipper, William Cunningham, Daniel Mattioda, "Locating and Consolidating Strategic Inventory," Western Decision Sciences Institute annual Meeting, Portland, OR, April 5-8, 2011.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

William Cunningham, Ryan Rowe, Ben Skipper, "Optimal CV-22 Centralized Intermediate Repair Facility Locations and Parts Repair," INFORMS annual meeting, Austin, TX, November 7-10, 2010.

FRIEND, MARK A., Maj, Department of Operational Sciences

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Mindrup, F., Friend, M., Bauer, K., "Selecting training and test images for optimized anomaly detection and material identification algorithms in hyperspectral imagery through robust parameter design," SPIE Defense and Security Symposium, April 25-29, 2011, Orlando, FL.

HEILMANN, SHARON G., Lt Col, Department of Operational Sciences

SPONSOR FUNDED RESEARCH PROJECTS

“Research, Analysis and Transition Support to the Director of Logistics and Sustainment Air Force Material Command.” Sponsor: HQ AFMC. Funding: \$350,000.

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: \$560,000.

REFEREED JOURNAL PUBLICATIONS

Heath, B. L. and R. R. Hill, 2010. “Some Insights into the Emergence of Agent-Based Modeling,” *Journal of Simulation* Vol. 4, No. 3, 163-169.

Johnson, A. W., T. Heiman, M. Cooper, and R. R. Hill. “Assessing Transport Aircraft Inspection Strategies,” *International Journal of Operations Research and Information Systems (IJORIS)*. Vol. 1, No. 4, 1-21. October-December 2010.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

MacKenzie, A., Miller, J. O. and Hill, R. R. 2010. “An Exploration of the Effects of Maintenance Manning on Combat Mission Readiness Utilizing Agent Based Modeling,” Proceedings of the 2010 Winter Simulation Conference, ed Johansson, Jain, Montoya-Torres, Yucatan and Hagan. IEEE, Piscataway, NJ.

Talafuse, Thomas, Hill, R. R. and Bestard, J. April 2011. “Characterization of Ballistic Impact Flashes Empirical Model Development,” Proceedings of the 52nd AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, Denver CO, April 4-7, 2011.

Talafuse, Thomas, Hill, R. R. and Bestard, J. May 2011. “Characterization of Ballistic Impact Flashes for Survivability Analyses Based on Empirical Models,” Proceedings of the 2011 Industrial Engineering Research Conference, Reno NV, May 21-25, 2011.

Haase, Casey and Hill, R. R. May 2011. “Applying Experimental Design to Live, Virtual, and Constructive (LVC) Environments,” Proceedings of the 2011 Industrial Engineering Research Conference, Reno NV, May 21-25, 2011.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Hill, R. R. May 2011. “Military Use of Experimental Design,” Proceedings of the 2011 Industrial Engineering Research Conference, Reno NV, May 21-25, 2011.

Leggio, D., Hill, R. R., Capehart, S., Rosener, A. G. June 2011. “A Monte Carlo Study Examining the Potential of Experimental Design Strategies for Wind Tunnel Testing,” Proceedings of the 2011 Quality and Productivity Research Conference, Roanoke, VA, June 7-9, 2011.

BOOKS AND CHAPTERS IN BOOKS

Hill, Raymond R. and Edward A. Pohl, “Heuristics and Their Use in Military Modeling” book chapter, Encyclopedia of Operations Research and Management Science, edited by James Cochran, Wiley Publishing, 2010.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Hill, R. R. 2010. Guest Editorial: Introduction to the Special Issue, *Journal of Simulation*, Vol. 4, No. 3, 149-150.

Hill, R. R. 2010. Book Review: “Managing Business Complexity: Discovering Strategic Solutions with Agent-Based Modeling and Simulation,” *Journal of Simulation*, Vol. 4, No. 3, 211-212.

Presentation: Experimental Design in a LVC Test Environment, 16th Annual ITEA LVC Conference, El Paso Texas, January 27, 2011 with Capt Casey Haase.

JOHNSON, ALAN W., Department of Operational Sciences

REFEREED JOURNAL PUBLICATIONS

Johnson, A., Heiman, T., Cooper, M., and Hill, R., 2010, “Assessing Transport Aircraft Inspection Strategies,” *International Journal of Operations Research and Information Systems* 1(4):1-21.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Hackleman, A., Johnson, A., and Ahner, D. “Nuclear Enterprise Performance Measurement,” Proceedings of the IIE Industrial Engineering Research Conference, Reno, NV, 22-24 May 2011.

Boykin, S., Jordan, J., and Johnson, A., “Operations Support with a Virtual Space Logistics Readiness Center,” Proceedings of the American Institute of Aeronautics and Astronautics Space 2010 Conference, Anaheim CA, 2010, AIAA-2010-8865.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

INFORMS National Meeting, November 7-10 2010, Austin TX (M. Toydas, A. Johnson, and D. Sandlin), “Fuel Savings Opportunities from Air Refueling.”

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Presentation to Air Force Chief Scientist, 4 May 2011, “AFIT - Air Mobility Command Fuel Efficiency Research.”

MATTIODA, DANIEL D., Maj, Department of Operational Sciences

REFEREED JOURNAL PUBLICATIONS

Skipper, Joseph B., John E. Bell, William A. Cunningham, and Daniel D. Mattioda (2010), “Forward Positioning and Consolidation of Strategic Inventories,” *Journal of Transportation Management*, Vol. 21, No. 1, pp. 27-41.

Barman, Samir, Daniel D. Mattioda, and Warren K. Fisher (2010), “Controlled Release Location of Jobs in a Hybrid of Job and Flow Shops,” *International Journal of Advanced Operations Management*, Vol. 2, No.3/4 pp. 162-184.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Park, A., Miller, J.O., and Mattioda, D. “Simulation Analysis of High Velocity Maintenance for the B-1B,” Proceedings of the 2011 Industrial Engineering Research Conference, Reno, Nevada, 21-25 May 2011.

John Bell, Joseph Skipper, William Cunningham, Daniel Mattioda, “Locating and Consolidating Strategic Inventory,” Western Decision Sciences Institute annual Meeting, Portland, OR, April 5-8, 2011.

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: \$208,400 – Miller 70%, Pettit 30%.

“Analysis of Noncombatant Evacuation Operations.” Sponsor: USEUCOM. Funding: \$71,940.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Mackenzie, A. S., Miller, J.O., and Hill, R. R. “An Exploration of the Effects of Maintenance Manning on Combat Mission Readiness Utilizing Agent Based Modeling,” Proceedings of the 2010 Winter Simulation Conference, ed. B. Johansson, S. Jain, J. Montoya-Torres, J. Huan, and E. Yucsan.

Park, A., Miller, J.O., and Mattioda, D. “Simulation Analysis of High Velocity Maintenance for the B-1B,” Proceedings of the 2011 Industrial Engineering Research Conference, Reno, Nevada, 21-25 May 2011.

Parson, C.R., Miller, J.O., and Weir, J.D. “Assessing Factors that Impact TNMCS for the B-1 Bomber,” Proceedings of the 2011 Industrial Engineering Research Conference, Reno, Nevada, 21-25 May 2011.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Parson, C.R., Miller, J.O., and Weir, J.D. “Simulation Modeling and Analysis of TNMCS for the B-1 Strategic Bomber,” A2L2 Conference, St. Louis, MO, 6-9 Dec 2010.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Chaired I-SIM sponsored session on Modeling of Military Systems and presented a briefing on Simulation and Analysis of USAF Maintenance and Supply Processes for the B-1 Bomber (highlighting two research theses sponsored by the AFGLSC) at the Conference for the International Federation of Operational Research Societies in Melbourne Australia from 10-15 July 2011.

MOORE, JAMES T., Department of Operational Sciences

SPONSOR FUNDED RESEARCH PROJECTS

“JDPAC and AFIT Distribution Research Proposal (LOC).” Sponsor: USTRANSCOM. Funding: \$500,000.

REFEREED JOURNAL PUBLICATIONS

Nance, R. L., A.G. Roesener, J.T. Moore, “An Advanced Tabu Search Approach to Solving the Mixed Payload Aircraft Loading Problem,” *Journal of Operational Research Society* 62 (2): 337-347 (2011).

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

“Optimizing Ground Times for AMC Aircraft in Afghanistan” by Maj Eric Bucheit and Dr. James T. Moore Military Operations Research Society Symposium, Naval Postgraduate School, Monterey California, 21-23 June 2011.

OGDEN, JEFFERY A., Department of Operational Sciences

SPONSOR FUNDED RESEARCH PROJECTS

“ECSS Research.” Sponsor: ECSS. Funding: \$39,143.

“The Insourcing Cycle Shift: Applying the Triple Helix Model to Analyze the Effects of Multi-dimensional Influential Factors on the Purchasing Function.” Sponsor: AFGLSC. Funding: \$33,096 – Ogden 70%, Pettit 10%, Johnson 10%, Miller 10%.

REFEREED JOURNAL PUBLICATIONS

Foster, S.T., Wallin, C., and Ogden, J.A. (2011) “Towards a better understanding of supply chain quality management practices,” *International Journal of Production Research*, Vol. 49, No. 8, 2285-2300.

Ogden, J.A., Wallin, C., and Foster, S.T. (2010) “On Baldrige Core Values and Commitment to Quality,” *Quality Management Journal*, Vol. 17, No. 3, 21-34.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Sprague, T.M., Ogden, J.A., and Hartman, P.L. (2011) “Achieving Enterprise Resource Planning (ERP) Success Through Focused End-User Education and Training Strategies,” published as a full paper and presented at the 21st Annual North American Research Symposium on Purchasing and Supply Chain Management, San Diego, California, March 2011.

OXLEY, MARK E., Department of Mathematics and Statistics

SPONSOR FUNDED RESEARCH PROJECTS

“Fusion of Disparate Sensor Exploitation Systems.” Sponsor: AFOSR. Funding: \$46,367.

“Sensor-Exploitation Fusion for Integrated Structural Health Monitoring.” Sponsor: AFRL/RB. Funding: \$45,000.

PETTIT, TIMOTHY J., Lt Col, Department of Operational Sciences

SPONSOR FUNDED RESEARCH PROJECTS

“Research, Analysis and Transition to the 478th Aeronautical Systems Group.” Sponsor: 478th AESG. Funding: \$766,000 – Pettit 40%, Hill 20%, Mattioda 20%, Sandlin 20%.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Received Honorable Mention in the Bernard J. La Londe Best Paper competition, presented at the 2011 Council of Supply Chain Management Professionals (CSCMP) Conference, recognized as one of the top 3 papers published by the *Journal of Business Logistics* in 2010. Journal article: “Ensuring Supply Chain Resilience: Development of a Conceptual Framework,” with Joseph Fiksel and Keely L. Croxton, *Journal of Business Logistics*, Spring 2010, Vol. 31, No. 1, pp. 1-21.

ROBBINS, MATTHEW J., Maj, Department of Operational Sciences

SPONSOR FUNDED RESEARCH PROJECTS

“NATC-A Transition Assessment Study.” Sponsor: NATC-A. Funding: \$87,200.

REFEREED JOURNAL PUBLICATIONS

Robbins, M.J., Jacobson, S.H., 2011, “Pediatric Vaccine Procurement Policy: The Monopsonist’s Problem,” *Omega*, 39.

Robbins, M.J., Jacobson, S.H., Sewell, E.C., 2010, “Pricing Strategies for Combination Pediatric Vaccines and their Impact on Market Share: Pediarix or Pentacel?” *Health Care Management Science*, 13(1).

Nikolaev, A.G., Robbins, M.J., Jacobson, S.H., 2010, "Evaluating the Impact of Legislation Prohibiting Hand-Held Cell Phone Use While Driving," *Transportation Research Part A: Policy and Practice*, 44.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Robbins, M. J., Jacobson, S.H., "The Altruistic Monopsonist Vaccine Formulary Pricing and Purchasing Problem," 2010 INFORMS National Meeting, November 7-10, 2010, Austin, TX.

Robbins, M. J., Shanbhag, U.V., Jacobson, S.H., "The Weighted Set Covering Game: A Vaccine Pricing Model For Pediatric Immunization," 2010 INFORMS National Meeting, November 7-10, 2010, Austin, TX.

Nikolaev, A.G., Robbins, M.J., Jacobson, S.H., "Evaluating the Impact of Legislation Prohibiting Hand-Held Cell Phone Use While Driving," 2010 INFORMS National Meeting, November 7-10, 2010, Austin, TX.

Capt. Brandon Bernardoni, Dr. Richard Deckro, Maj. Matthew Robbins, "Utilizing Social Network Analysis in Support of Nation Building," 79th Military Operations Research Society Symposium, Monterey, CA, June 2011. Presented in WG 33 - Social Science Methods and Application & WG 34 -Computational Social Sciences.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Abbas, A., Herring, S., Robbins, M., Simms, K., Spetzler, C. "Peer-To-Peer Decision Training: Teaching Decision Skills to Troubled Teens," *OR/MS Today*, 38(4).

SANDLIN, DORAL E., Lt Col, Department of Operational Sciences

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Jordan, J. Weir, JD, and Sandlin, DE, "A Value-Focused Network Optimization Solution for Transportation Mode Selection," Western Decision Science Annual Meeting 2011, Portland, OR.

Jordan, J., Weir, JD, and Sandlin, DE, "Multiobjective Decision Programming for the Multiobjective Minimum Cost Flow Problem," Industrial Engineers Research Conference 2011, Reno, NV.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

INFORMS National Meeting, November 7-10 2010, Austin TX (M. Toydas, A. Johnson, and D. Sandlin), "Fuel Savings Opportunities from Air Refueling."

SKIPPER, JOSEPH B., Maj, Department of Operational Sciences

REFEREED JOURNAL PUBLICATIONS

Skipper, Joseph B., John E. Bell, William A. Cunningham, and Daniel D. Mattioda (2010), "Forward Positioning and Consolidation of Strategic Inventories," *Journal of Transportation Management*, Vol. 21, No. 1, pp. 27-41.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Bell, John, Joseph Skipper, William Cunningham, and Daniel Mattioda (2011), "Locating and Consolidating Strategic Inventory," Western Decision Science Institute Annual Meeting, Portland, OR.

Lanier, Christopher and Joseph B. Skipper (2011), "Supply Chain Synchronization: Improving Distribution Velocity from the United States to Iraq," Western Decision Science Institute Annual Meeting, Portland, OR.

WEIR, JEFFERY D., Department of Operational Sciences

SPONSOR FUNDED RESEARCH PROJECTS

"Research, Analysis and Transitional Support to the United States Strategic Command Joint Force Component Command for Intelligence, Surveillance and Reconnaissance (JFCC-ISR)." Sponsor: STRATCOM. Funding: \$40,000 – Weir 90%, Chambal 10%.

REFEREED JOURNAL PUBLICATIONS

Bell J. E., and Weir, J. D, "Location Analysis: Application of ReVelle and Rosing's Roman Empire Problem," *Decision Sciences Journal of Innovative Education*, 2010.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF FULL PAPER REVIEW

Jordan, J. Weir, JD, and Sandlin, DE, "A Value-Focused Network Optimization Solution for Transportation Mode Selection," Western Decision Science Annual Meeting 2011, Portland, OR.

Jordan, J., Weir, JD, and Sandlin, DE, "Multiobjective Decision Programming for the Multiobjective Minimum Cost Flow Problem," Industrial Engineers Research Conference 2011, Reno, NV.

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Hu, BA, Weir, JD, and Wu, T, "Decentralized Operation Strategies for Integrated Building Energy System," Industrial Engineers Research Conference 2011, Reno, NV.

OTHER SIGNIFICANT PROFESSIONAL ACTIVITIES

Invited Speaker, Decision Analysis Society, Gutman, A. and Weir, J.D., "Sensitivity Analysis of Decision Models via Random Sampling of Vectors in a Bounded Region," INFORMS Annual Meeting, Austin TX, Nov 2010.

7. TECHNOLOGY TRANSFER

7.1. COOPERATIVE RESEARCH AND DEVELOPMENT AGREEMENTS

- “ATD: Frame-Theoretic Information Fusion for Threat Detection,” USAF CRADA 11-AFIT-06,
Collaborator: University of Missouri, Faculty Investigator: Dr. Matthew C. Fickus, Effective Date:
27 January 2011, Term: 24 months.
- “Beam Control for Optical Phased Array Weapons,” USAF CRADA 11-AFIT-14, Collaborator: the Optical
Sciences Co, Faculty Investigator: Dr. Salvatore J. Cusumano, Effective Date: 26 April 2011, Term: 60
months.
- “Directed Energy Short Courses Continued Development and Delivery,” USAF CRADA 11-AFIT-13,
Collaborator: Directed Energy Professional Society, Faculty Investigator: Dr. Salvatore J. Cusumano,
Effective Date: 26 April 2011, Term: 60 months.
- “Experimental and Modeling Studies of Biosensor for Nerve Gas Detection,” USAF CRADA 11-AFIT-02,
Collaborator: University of Toledo, Faculty Investigator: Dr. Mark N. Goltz, Effective Date: 12 January
2011, Term: 15 months.
- “Intelligence, Surveillance & Reconnaissance Research Program,” USAF CRADA 11-AFIT-05,
Collaborator: Sciences Applications International Corp, Faculty Investigators: Dr. Ronald F. Tuttle &
Dr. David J. Bunker, Effective Date: 20 September 2011, Term: 36 months.
- “Kinetics of Chlorinated Hydrocarbon Degradation Assisted by Modified Bimetallic Carbon and Peptide
Nanotubes and Transport of Nanosilver (nAg) in Groundwater,” USAF CRADA 11-AFIT-01,
Collaborator: Wright State University, Faculty Investigator: Dr. Mark N. Goltz, Effective Date: 27 January
2011, Term: 12 months.
- “Logistics Studies to Optimize Movement of Personnel and Equipment on Loading Dock,” USAF CRADA
11-AFIT-10, Collaborator: YRC Enterprise Services, Inc., Faculty Investigator: Dr. John O. Miller,
Effective Date: 24 January 2011, Term: 6 months.
- “Low Dose Effects of Sarin in Mammalian Systems,” USAF CRADA 11-AFIT-07, Collaborator: Wright
State University, Faculty Investigator: Dr. Charles A. Bleckmann & Maj LeeAnn Raczk, Effective Date:
24 March 2011, Term: 12 months.
- “Next Generation Field-Programmable Gate Array (FPGA) Capabilities for Cybersecurity,” USAF CRADA
11-AFIT-08, Collaborator: Global Velocity, Inc., Faculty Investigator: Dr. Rusty O. Baldwin, Effective
Date: 31 March 2011, Term: 12 months.
- “Non-GPS Navigation Using Radio-Based Ranging Combined with Additional Sensors (“Net-Enabled Non-
GPS Navigation”),” USAF CRADA 11-AFIT-03, Collaborator: Raytheon Company, Faculty Investigator:
Maj. Kenneth A. Fisher, Effective Date: 19 November 2010, Term: 24 months.
- “Novel Laser-Based Diagnostics for Quantitative Characterization of Burning in the Turbine Phenomenon,”
USAF CRADA 11-AFIT-18, Collaborator: Spectral Energies, LLC, Faculty Investigator: Dr. Marc D.
Polanka, Effective Date: 24 June 2011, Term: 9 months.
- “Ohio Space Grant OhioSAT Aerospace Workforce Development,” USAF CRADA 11-AFIT-17,
Collaborator: The Ohio Aerospace Institute (OAI), Faculty Investigator: Dr. Jonathan T. Black, Effective
Date: 26 April 2011, Term: 24 months.

“Real-time Remote Detection of HR-VOC Content in Flares,” USAF CRADA 11-AFIT-12, Collaborator: Spectral Sciences, Inc., Faculty Investigator: Dr. Kevin C. Gross, Effective Date: 31 March 2011, Term: 12 months.

“Research Alliance on Nano-Sensor Research and Development Program Agreement,” USAF CRADA 11-AFIT-15, Collaborator: University of Toledo & Kwangwoon University, Faculty Investigator: Dr. Mark N. Goltz, Effective Date: 18 August 2011, Term: 24 months.

“Terahertz Component-Level Research for Sensing Applications,” USAF CRADA 11-AFIT-04, Collaborator: Wright State University, Faculty Investigator: Dr. Ronald A. Coutu, Effective Date: 19 January 2011, Term: 12 months.

“Theory of Multiresolution Classification with Bases and Frames,” USAF CRADA 11-AFIT-22, Collaborator: Carnegie Mellon University, Faculty Investigator: Dr. Matthew C. Fickus, Effective Date: 26 July 2011, Term: 36 months.

7.2. EDUCATION PARTNERSHIP AGREEMENTS

“Educational Partnership,” USAF AFIT EPA 2011-01, Collaborator: Southwestern Ohio Council on Higher Education, Faculty Investigator: Dr. Paul J. Wolf, Effective Date: 27 September 2011, Term: 60 months.

APPENDICES

APPENDIX A: POST-DOCTORAL AND OTHER RESEARCH ASSOCIATES CREDENTIALS

KANG, SUNG-MU, Scientist Research Associate, Department of Engineering Physics, AFIT Appointment Date: 2011 (AFIT/ENP); BS, 1994, and MS, 1997, Metallurgical Engineering, Department of Metallurgical and Material Engineering, Kookmin University, Seoul, Korea; PhD, 2006, Engineering, Department of Electrical Engineering and Computer Science, University of California, Irvine, CA; Post doctoral Scholar, 2006, Department of Electrical Engineering and Computer Science, University of California, Irvine, CA ; Post doctoral Scholar, 2007, Vitreous State Laboratory, The Catholic University of America, DC. Dr. Kang specializes in semiconductor device design, processing, and electrical/optical characterization. Tel. 937-255-3636 x4694, email: Sungmu.Kang.ctr.ks@afit.edu

KEENAN, CAMERON B., National Research Council Post-Doctoral Fellow, AFIT Appointment Date: 2011 (AFIT/ENP); BS, Physics, Case Western Reserve University, 2002; PhD, Physics, West Virginia University, 2011. Dr. Keenan's work is focused on radiometric remote sensing and laser material interactions. Tel. 937-723-1403. Email: Cameron.Keenan.ctr@afit.edu

LEAKEAS, CHARLES L., Research Associate, Department of Engineering Physics, Center for Directed Energy, AFIT Appointment Date: 2009 (AFIT/ENP); BS, Mechanical Engineering, Purdue University, 1988; MS, Applied Mathematics, Purdue University, 1992; PhD, Engineering Science and Mechanics, University of Alabama, 2001. Dr. Leakeas' scope of work includes wave-optics simulations, high performance computing, and phased array lasers. Tel. 937-255-3636 x4688 (DSN 785-6565 x4688), email: Charles.Leakeas@afit.edu

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Leakeas, Charles L., Capehart, Shay R., Bartell, Richard J., Cusumano, Salvatore J., and Whiteley, Matthew R., "Performance modeling of the effects of aperture phase error, turbulence, and thermal blooming on tiled subaperture systems," Proceedings of the SPIE Atmospheric Propagation VIII, Vol. 8038, Paper No. 803803 (May 2011). [CDE]

NAUYOKS, STEPHEN E., Postdoctoral Research Associate, Department of Engineering Physics, AFIT Appointment Date: 2010 (AFIT/ENP); BS, Applied Mathematics, 2002; MS, Applied Mathematics, New Jersey Institute of Technology, Newark, NJ, 2004; PhD, Physics, Texas Christian University, Fort Worth, TX, 2009. Dr. Nauyoks has been modifying a CASI system to be able to run full polarimetric scatterometry analysis using lasers at variable wavelengths of unique materials with nano and micron sized structures. Tel. 937-255-6565 x7501 (DSN 785-6565 x7501), email: Stephen.Nauyoks.ctr@afit.edu

REFEREED CONFERENCE PAPERS ACCEPTED ON THE BASIS OF ABSTRACT REVIEW

Vap, J.C., Nauyoks, S.E., Fitzgerald, T.M., and Marciniak, M.A., "Development of tunable polarimetric optical scattering instrument from 4.3-9.7 microns," Proceedings of the SPIE Vol. 8154, Paper No. 8154-12 (2011). [CDE]

SABELKIN, VOLODYMYR, Researcher, Department of Aeronautics and Astronautics, AFIT Appointment Date: 2003 (AFIT/ENY); MS, Kharkov Aviation Institute, Ukraine, 1976; PhD, Kharkov Aviation Institute, Ukraine, 1980; Dr. Sci., Kharkov Aviation Institute, Ukraine, 1989; Professor, Kharkov Aviation Institute, Ukraine, 1991. Dr. Sabelkin has authored over 60 papers and 100 patents. Dr. Sabelkin's research interests are on composite and smart materials, fatigue and fracture, contact mechanics, micromechanics, plasticity and modeling. Tel. 937-255-3636 x7476 (DSN 785-3636 x7476), email: Volodymyr.Sabelkin@afit.edu

SODEMANN, ANGELA A., Postdoctoral Research Assistant, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2010 (AFIT/ENG); BS, Music, Wisconsin Lutheran College, 2003; MS, Mechanical Engineering, University of Wisconsin – Milwaukee, 2006; PhD, Mechanical Engineering, Georgia Institute of Technology, 2009. Dr. Sodemann's research interests include control of mechatronic systems; applications of artificial intelligence and machine learning; machine vision and image processing; autonomous vehicles; biomimetic robotics; and modeling of dynamic systems. Tel. 937-255-3636 x4236 (DSN 785-3636 x4236), email: Angela.Sodemann@afit.edu

XING, YUN, Postdoctoral Research Associate, Department of Engineering Physics, AFIT Appointment Start Date: May, 2011 (AFIT/ENP); Education: BS, Biochemical Engineering, Tianjin University, China, 1998; PhD, Bioengineering, Georgia Institute of Technology, Atlanta GA, 2005 Postdoctoral fellow in cancer nanotechnology, Stanford University, Stanford CA, 2006-2008 Dr. Xing's first project involves the characterization of thermal protection materials for hypersonic space vehicles by using thermal flash and atomic force microscopy techniques. Her second project focuses on inactivation of biological weapons agents such as bacillus anthracis by heat, ionizing radiation and chemical reagents. Tel. 937-255-6565 x4241 (DSN 785-6565 x4241), email: Yun.Xing@afit.edu

YOON, WOO-JUN, Postdoctoral Research Associate, Department of Engineering Physics, AFIT Appointment Date: 2010 (AFIT/ENP); BS, Metallurgical Engineering, Department of Metallurgical Engineering, Korea University, Seoul, Korea, 1999; MS, 2006, and PhD, 2009, Electrical Engineering, Department of Electrical and Computer Engineering, The Ohio State University, Columbus, OH. Dr. Yoon specializes in semiconductor device design, processing, and electrical/optical characterization. Tel. 937-255-6565 x4693 (DSN 785-6565 x4693), email: Woojun.Yoon.ctr@afit.edu

APPENDIX B: SELECTED ACRONYM LIST

There are a number of abbreviations for organizations that are used in this report. This alphabetical listing includes only selected organizations.

711 HPW/RH	711 th Human Performance Wing Human Effectiveness Directorate
711 HPW/USAFSAM	711 th 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
AFGSC	Air Force Global Strike Command
AFIAA	Air Force Intelligence Analysis Agency
AFIT	Air Force Institute of Technology
AFMC	Air Force Materiel Command
AFMOA	Air Force Medical Operations Agency
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/RI	AFRL/Information Directorate
AFRL/RX	AFRL/Materials and Manufacturing Directorate
AFRL/RW	AFRL/Munitions Directorate
AFRL/RZ	AFRL/Propulsion Directorate
AFRL/RY	AFRL/Sensors Directorate
AFRL/RV	AFRL/Space Vehicles Directorate
AFPC	Air Force Personnel Center
AFSEO	Air Force Seek Eagle Office (46 SK/SKE)
AFSPC	Air Force Space Command
AFTPS	Air Force Test Pilot School
AFTAC	Air Force Technical Applications Center
AFWA	Air Force Weather Agency
AHS	American Helicopter Society
AIAA	American Institute of Aeronautics and Astronautics
AMC	Air Mobility Command
AMCOM	Aviation and Missile Command
AMRDEC	Aviation and Missile Research Development and Engineering Center
ASME	American Society of Mechanical Engineers
ASC	Aeronautical Systems Center
AU	Air University
CASS	Center for Atmospheric and Space Sciences
DAGSI	Dayton Area Graduate Studies Institute
DARPA	Defense Advanced Research Projects Agency
DHS	Department of Homeland Security
DIA	Defense Intelligence Agency
DISAM	Defense Institute of Security Assistance
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
JIEDDO	Joint Improvised Explosive Device Defeat Organization
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
NATC-A	National Air Traffic Controllers Association
NAVSEA	Naval Sea Systems Command
NC DOT	North Carolina Department of Transportation
NGA	National Geospatial-Intelligence Agency
NNSA	National Nuclear Security Administration
NPS	Naval Postgraduate School
NSA	National Security Agency
NSF	National Science Foundation
NSWC	Naval Surface Warfare Center
OAI	Ohio Aerospace Institute
ONR	Office of Naval Research
OSD	Office of the Secretary of Defense
ROKA	Republic of Korea Army
SAF	Office of the Secretary of the Air Force
SERDP	Strategic Environmental and Development Program
SMC	Space and Missiles Systems Center
SPAWAR	Space and Naval Warfare Systems Command
SPIE	The International Society for Optical Engineering
TuAF	Turkish Air Force
USAF	United States Air Force
USAFA	U.S. Air Force Academy
USNORTHCOM	United States Northern Command
USSOCOM	United States Special Operations Command
USSTRATCOM	United States Strategic Command
USTRANSCOM	United States Transportation Command
WPAFB	Wright-Patterson Air Force Base
WSU	Wright State University

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