

TEACHING AND RESEARCH RELATED EXPERIENCE

Current **Systems Engineer and Operations Analysis Group Manager**
 Member, Group Technical Staff
 Lockheed Martin Missile and Fire Control – Dallas

Performs technical planning, system integration, verification and validation, cost and risk, and supportability and effectiveness analyses for total systems. Analyses are performed at all levels of total system product to include: concept, design, fabrication, test, installation, operation, maintenance and disposal. Ensures the logical and systematic conversion of customer or product requirements into total systems solutions that acknowledge technical, schedule, and cost constraints. Performs functional analysis, timeline analysis, detail trade studies, requirements allocation and interface definition studies to translate customer requirements into hardware and software specifications. Specifically, working on programs to defeat improvised explosive devices and provide advanced munitions and payloads for rocket and missile fire support.

- Developed curriculum and taught courses in Decision Analysis, Spreadsheet Modeling for Optimization Techniques and Quantitative Methods for Business;
- Modeled single and multi-attribute problems involving uncertainty to help decision makers gain insight and understanding.
- Developed and released the initial version of the stochastic missile mix and inventory analysis model to support numerous international business capture events for air and missile defense, supporting the acquisition of billions of dollars missile defense
- Developed an RF directed energy simulation to support development of a new technology for remote controlled IED defeat.
- Performed QFD, along with developing the CONOPS and COEs that supported the gap analysis identification and requirements definition of the Mobile Anti-Sniper Area Protection System Technology Integration Initiative
- Provided campaign-level transportation logistics analysis to support the marketing of a new missile technology
- Applied the value-focused thinking decision analytic approach across several domains, to include completing trade analyses to support new munition variants for the GMLRS and system design for the centralized common controller device for unmanned systems

Current **Adjunct Instructor** Southern Methodist University

- Developed curriculum for Systems Analysis Design and Probability and Statistics courses in support of a virtual learning graduate Executive cohorts for experienced professionals from SPAWAR, South Carolina and Lockheed Martin in Dallas, Texas.

2005 **Senior Software Engineer / Research Analyst** MIT-Lincoln Labs, Lexington, MA

Engaged in Blue Force Tracking and combat identification to enhance situational awareness while minimizing fratricide; monitored the development of a sensor fusion cell for persistent surveillance and dissemination of actionable intelligence; investigated advanced fusion sensor systems to combat the threat of improvised explosive devices; and worked to develop an open systems architectural approach for airborne radar.

2004 **Adjunct Instructor** College of New Jersey, Trenton, NJ

- Developed curriculum for and taught courses in Calculus.

2003 – 2005 **Inspector General for the State of New Jersey**

Responsible for conducting inquiries and reporting to the State Adjutant General on the discipline, efficiency, economy, morale, training and readiness of the New Jersey National Guard to meet its every increasing global responsibilities and primary homeland security mission. Oversees the Command Organization Inspection Program; and teaches and trains Guard members across all domains wherever possible.

2002-2003 **Deputy Director (Program Manager)**
Army Quadrennial Defense Review Office, Pentagon, Washington, D.C.

Responsible for managing, coordinating and executing the Army staff effort to accomplish numerous Defense Planning Guidance and Program Decision Memorandum-directed studies and in developing the FY05 Defense Planning Guidance.

- Integrated and synchronized study teams formed from across the Army Staff and Secretariat to address over 50 Defense Planning Guidance and 29 Program Decision Memorandum studies that successfully advanced and protected Army equities.
- Developed a detailed study management plan that provided the Army senior leadership (Secretary of the Army, Chief of Staff, principal staff officers and the Combatant Commands) accurate and timely information to affect direction, policy and characterization of the Army position.
- Coordinated and executed over \$2 million in contracts to complete quick-turn and detailed long-lead analyses as part of the study management plan.

2000-2002 **Assistant Professor** Air Force Institute of Technology

Advise master's theses and Ph.D. dissertations and develop capstone research projects; curriculum development; develop creative instructional techniques to advance student learning through innovative use of computers in the classroom; consult with various DoD and AF organizations, dealing with problems requiring scientific analysis support.

- Research consortium that advanced the field of group theoretic tabu search to solve difficult combinatorial optimization problems, e.g., the theater distribution vehicle routing and scheduling problem along with the tanker crew scheduling problem.
- Developed the first generalized skill level inventory decision support system to assist Air Force contracting career field managers reverse the negative trends in recruitment and retention.
- Developed an optimization model to identify cost-effective alternatives for delivering fuel in Central Europe. The model analyzes how system constraints affect fuel flow from wholesale to operating bases, quantitatively measuring and comparing operational capabilities of each alternative.
- Worked in a cross-discipline collaboration to introduce a new paradigm for self-evolving adaptive interfaces to increase affordability of Air Force weapon systems and implementation of new technologies in Ohio industry.
- Advised research that developed a computer simulation model to address just-in-time ammunition support to the Stryker Brigade Combat Team.

2000-2002 **Assistant Professor** Air Force Institute of Technology (continued)

- Developed academic curriculum and taught numerous courses in graduate Operations Research - Quantitative Decision Making using spreadsheets, Analysis of Algorithms with OR Applications, High Resolution Combat Modeling, Aggregated Combat Modeling, Tabu Search Metaheuristic, Personnel Modeling using Operations Research, Solving OR Problems using GAMS, Decision Analysis.

1997-2000 **Senior Analyst/Division Chief** Center for Army Analysis, Fort Belvoir, VA

Performed campaign/logistics analyses of the Army's current and future capability through the application of computerized combat simulations and other management science tools to assess total force design and resource requirements in support of the Army programming, planning and budgeting process.

- Received the Director's Award for Excellence for the *Chief of Staff of the Army's Strategic Responsiveness Study* that serves as the foundation for the Chief of Staff of the Army's vision of the Army of the 21st century that is more easily deployable and agile while maintaining its lethality and dominance on the battlefield.
- Conducted the foundational campaign analysis that modeled both chemical and biological munitions employment as part of the Total Army Analysis (TAA) for 2007. TAA is the biennial process for determining the size and content of the Army force structure through an iterative, risk-benefit, trade-off analysis.
- Received the Payne Award for Excellence in Analysis in the group category, at the 37th Army OR Symposium for the development of the *Stochastic Analysis for Deployments and Excursions* (SADE) model that extrapolates future small-scale contingency (SSC) operations from historical database of known SSC deployments.

1997-2000 **Instructor** George Mason University

Developed curriculum for and taught courses in Numerical Analysis, Probability and Statistics and Finite Math. Developed creative instructional techniques to advance student learning through innovative use of computers in the classroom.

- Integrated progressive research projects applying mathematics to real world problems as a mandatory part of curriculum.
- Rated well above average in all evaluated areas university-wide.

1997-1998 **Adjunct Instructor** Northern Virginia Community College

Developed curriculum for and taught courses in Calculus and Probability and Statistics.

1997-1998 **Adjunct Instructor** Strayer University

Developed academic curriculum for and taught graduate-level courses for Business – Quantitative Methods for Business and Descriptive Statistics. Developed creative instructional techniques that advanced student learning through innovative use of spreadsheets and calculators in the classroom.

- Integrated progressive research projects applying operations research techniques to real world problems as a mandatory part of curriculum.

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1996-1997 **Assistant Instructor** University of Texas at Austin

Developed creative instructional techniques that advanced student learning in Pre-Calculus through innovative use of calculators in the classroom.

- Rated well above average in all 13 evaluated areas university-wide.

1994-1997 **Instructor** Austin Community College, Austin, Texas

Developed academic curriculum for and taught Intermediate and College Algebra, Business Calculus I and II, and Differential and Integral Calculus.

1993 **Analyst** Operations Research Center, West Point, New York

- Skillfully developed an Installation Efficiency Analysis decision support system prototype for the Assistant Secretary of the Army for Financial Management to facilitate making Army installations better power projection platforms for years to come.

1989-1993 **Assistant Professor** Department of Mathematical Sciences, West Point, NY

Advise and develop capstone research projects; curriculum development; develop creative instructional techniques to advance student learning through innovative use of computers in the classroom.

- Recognized Academy expert in the innovative use of computers in the classroom.
- Course Director for Numerical Analysis, Numerical Solutions to Ordinary Differential Equations and Research Seminars in Applied Mathematics.
- Taught courses in Differential and Integral Calculus, Differential Equations and Discrete Dynamical Systems.
- Coordinated, resourced and facilitated two successful workshops – Math Modeling Workshop for the Faculty Advancement in Mathematics (FAIM), sponsored by the Consortium for Mathematics and its Applications (COMAP) and the Calculus Reform Workshop for the New Jersey section of the Mathematical Association of America sponsored by the National Science Foundation.
- Conducted introductory workshops at local civilian universities on integrating computer algebra systems into their core curriculum.

1992-1993 **Adjunct Professor** Orange County Community College, Middletown, NY

- Developed curriculum for and taught night classes in Developmental Algebra, Basic Math I and II, College Algebra and College Trigonometry.

1985-1987 **Reserve Advisor** 5th Army Readiness Group, Fort Sam Houston, Texas.

Responsible for teaching courses in Construction Management, Training Management and numerous other courses in Combat and Construction Engineering.

- Assisted engineering managers complete their management plans for the numerous vertical and horizontal construction projects to be completed by their engineer Group during their upcoming annual training period.

1983: **Trainer** Engineer Officer Basic Course, Fort Belvoir, Virginia.

Responsible for teaching and mentoring future engineer leaders across all engineering disciplines.

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EDUCATION

Degrees Ph.D., Operations Research, University of Texas at Austin, 1998
 M.A., Mathematics, University of Texas at Austin, 1989
 B.S., Applied Sciences and Engineering, United States Military Academy
 West Point, NY, 1979

MILITARY EDUCATION

1993-94 Command and General Staff College (Resident), Fort Leavenworth, KS
1986 Combined Arms Service Support School, Fort Leavenworth, KS
1983 Atomic Demolitions Munitions Course, Fort Belvoir, VA
1983 Engineer Officer Advanced Course, Fort Belvoir, VA
1980 Ranger School, Fort Benning, GA
1979 Engineer Officer Basic Course, Fort Belvoir, VA
1977 Airborne School, Fort Benning, GA

STUDENT RESEARCH

Committee member on the following Ph.D. committee:

Crino, MAJ John R. *A Group Theoretic Tabu Search Methodology for Solving the Theater Distribution Vehicle Routing and Scheduling Problem*. Air Force Institute of Technology. Dissertation successfully defended in May 2002.

Served as a thesis advisor or co-advisor on the following Master theses:

Tekeligolu, 1Lt Umit. *A Reactive Tabu Search Metaheuristic Extension of the Air Refueling Tanker Assignment Problem*. Air Force Institute of Technology. Thesis successfully defended in March 2001.

Bertulis, CPT Todd. *Interim Brigade Combat Team (IBCT) Material Distribution Study*. Air Force Institute of Technology. Thesis successfully defended in March 2002.

Botkin, Capt Brian J. *An Analysis of Alternate Fuel Delivery Methods for the Central Europe Pipeline System*. Air Force Institute of Technology. Thesis successfully defended in February 2002.

Mercier, Capt Larry D. Jr. *A Generalized Decision Support System for the Contracting Career Field*. Air Force Institute of Technology. Thesis successfully defended in February 2002.

PUBLICATIONS

Crino, John R., James T. Moore, J.W. Barnes and W.P. Nanry. 2002. Solving the Theater Distribution Vehicle Routing and Scheduling Problem Using Group Theoretic Tabu Search. *Mathematical and Computer Modeling*, Volume 39, Issues 6-8, March 2004, Pages 599-616.

Nanry, W.P. and J.W. Barnes. 2000. Solving the Pickup and Delivery Problem with Time Windows using Reactive Tabu Search. *Transportation Research*, part B 34, pgs. 107-121.

Nanry, William. *Army Phased Threat Distribution Support Analysis FY 07*, CAA-R-00-18, Center for Army Analysis, January 2000 (SECRET).

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Nanry, William. *Bio Excursion Campaign Analysis-TAA-07*, CAA-MR-99-33, Center for Army Analysis, October 1999, (SECRET).

Nanry, William. *Chemical Campaign for SRA-07*, CAA-R-99-1, Center for Army Analysis, November 1999 (SECRET).

Nanry, William. *Chief of Staff of the Army Special Project-SWA*, CAA-MR-99-34, Center for Army Analysis, October 1999 (SECRET).

Nanry, William. *Conventional Campaign for Support Force Requirements Analysis – 2007*, CAA-R-99-3, Center for Army Analysis, December 1999 (SECRET).

Nanry, William. *Comparison of Chemical and No Chemical Campaigns - SRA-07*, CAA-R-99-5, Center for Army Analysis, December 1999 (SECRET).

Nanry, William. *Tactical Conflict Resolution Model-Battlefield Planning and Visualization*, CAA-R-00-31, Center for Army Analysis, May 2000.

Nanry, William P. 1998. *Solving the Precedence Constrained Vehicle Routing Problem with Time Windows Using the Reactive Tabu Search Metastrategy*. Ph.D. Dissertation, Department of Operations Research and Industrial Engineering, University of Texas at Austin, Austin, Texas.

Winter 1991. Book review on the Derive manual. Calculus and the Derive Program: Experiments with the Computer, by Lawrence G. Gilligan and James F. Marquardt, Sr., published in *Mathematics and Computer Education*.

September 1991. Software review on a Scientific Wordprocessor, published in *The College Mathematics Journal*.

Nanry, William P. 1989. *Select Ordering Techniques Used in Conjunction with the Preconditioned Conjugate Gradient Method*. Masters Report, University of Texas at Austin, Austin, Texas.

LECTURES AND WORKSHOPS

June 2010, *Protecting the Homeland from an EMP Attack*, presented at the annual MORS Symposium at Quantico, VA.

- Presentation selected best in Composite Group and has been submitted for Barchi Award consideration and publishing in the Military Operations Research journal.

November 2009, session chair for the Military Applications Society Working Group at the annual INFORMS conference in San Diego, CA.

April 2009, *Econometric Frontier Analysis for Developing New Technologies*, presented at the Military Applications Society INFORMS conference in Huntsville, AL.

November 2001, *Solving the Theater Distribution Multiple Trip Multiple Service Vehicle Routing and Scheduling Problem with Group Theoretic Tabu Search* presented by Crino, John R., James T. Moore, and William P. Nanry, at the annual INFORMS conference, Miami, FL.

February 2000, *The Concept Evaluation Model*, presented at the MORS mini-symposium in preparation for the Quadrennial Defense Review for 2001, in McLean, VA.

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October 1999, *Tactical Conflict Resolution Model-Battlefield Planning and Visualization*, presented at the 1999 Army Operations Research Society (AORS) Conference in Fort Lee, VA.

May 1997, *Solving the Precedence Constrained Routing Problem with Time Windows using Reactive Tabu Search*, presented at the Spring 1997 INFORMS Conference in San Diego, CA.

July 1992. Math Modeling Workshop for the Faculty Advancement in Mathematics (FAIM), sponsored by the Consortium for Mathematics and its Applications (COMAP).

June 1992. Calculus Reform Workshop for the New Jersey section of the Mathematical Association of America. Sponsored by the National Science Foundation.

Spring 1992, Introductory workshop at Marist College, Dutchess County Community College and Rutgers University on *Integration of Derive, a Computer Algebra System, into the Core Curriculum*.

PROFESSIONAL ORGANIZATIONS

Member of the Military Operations Research Society (MORS)

Member of the Institute for Operations Research and Management Science (INFORMS)

Member of Omega Rho

AWARDS AND DECORATIONS:

- * Sigma Iota Epsilon Logistics Management Professor of the Year 2002
Sigma Beta Chapter, Air Force Institute of Technology
- * AFIT Student Association Instructor of the Quarter – Fall 2000
- * Director's Award for Excellence, September 1999, Center for Army Analysis,
Chief of Staff of the Army's Strategic Responsiveness Study
- * Payne Award for Excellence in Analysis, 1998, Group Category, 37th Army Operations Research Symposium, *Stochastic Analysis for Deployments and Excursions (SADE)*.
- * Certificates of Achievement/Accomplishment in Combat Modeling
 - Antiarmor Assessment for the Country of Jordan
 - Support Requirements Analysis – '05
 - Southwest Asia (SWA) Campaign Analysis for SRA – '07
 - Chief of Staff of the Army Special Project – SWA
 - Army Phase Threat Distribution Support Analysis FY07
 - Biological Excursion Campaign Analysis – TAA07
 - Attrition Calibration (ATCAL) Analysis using SWA Scenario
 - Royal Saudi Land Force Structure Analytical Support
 - Tactical Conflict Resolution Model – Battlefield Planning & Visualization

Legion of Merit

Meritorious Service Medal, five oak leaf clusters

Army Commendation Medal

Global War on Terrorism Service Medal

Additional information available at <http://www.nanry.net>