Research and Sponsored Programs Office (RSPO)   Research Naval Postgraduate School (NPS Research Newsletter), 1

2009-12-01

Research Naval Postgraduate School, v.2, no. 2, December 2009

Monterey, California, Research and Sponsored Programs, Office of the Vice President and Dean of Research, Naval Postgraduate School (U.S.)

https://hdl.handle.net/10945/15496

RESEARCH
NAVAL POSTGRADUATE SCHOOL

RESEARCH AT NPS

Through NPS's involvement with the Navy's technology-transfer program, the RSPO is notified of "excess equipment" at other laboratories. Although there is competition to obtain the equipment, NPS was recently notified that we will be the recipient of a Palomar Technologies (Hughes) Model 2460-V automatic ball bonder. Used to support microelectronics engineering, the unit is a self-contained PC with enhanced pattern-recognition software, programmable light, and very good technical data. Faculty in physics and electrical and computer engineering expressed interest in the equipment and it will soon arrive at NPS. Technical support is offered to assist with setting up the equipment at NPS.

A few reminders: 1) Principal Investigator Indirect Cost Reports will soon be online at the DORS/DMAS website; 2) Final attestations for FY09 were to be completed by 31 December; reminders will soon be sent to PIs for those accounts still requiring attestation. The attestation must be completed online. Remember to select FY09 on the DORS/DMAS entry screen. The "attestation" is integral to NPS accountability in the management of sponsored-funding activities.

BROWN-BAG SEMINAR SERIES
MAE CONFERENCE ROOM, WATKINS HALL, ROOM 302

- 10 February, Wednesday. Participating in SBIRs/STTRs
- 10 March, Wednesday. The Patent Process
- 12 April, Monday. ITAR and Export Control

NPS RENEWS LONGSTANDING RELATIONSHIP WITH SPAWARSYSCOM SPACE FIELD ACTIVITY

The memorandum of agreement (MOA) between SPAWARSYSCOM Space Field Activity (SSFA) and NPS was renewed in December. The SSFA was created in November 1999 to focus naval technology, research, development, and acquisition activities in the National Reconnaissance Office (NRO) and the Department of the Navy (DoN). The SSFA represents the Navy's commitment to provide line-management resources to the NRO. The SSFA is therefore in a position to advocate and support a strong NPS program for the benefit of the DoN, NRO, and the warfighter.

The NPS Space Systems Academic Group (SSAG) serves as the focal point for all space-related research performed at NPS. The SSAG couples space research with the graduate education of military officers and has established working relationships with many government space-systems research, development, and acquisition organizations.
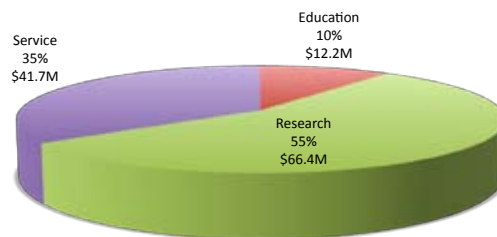
As a primary employer of space subspecialty coded naval officers, the SSFA has increased its participation in NPS activities over the years. The SSFA has funded curricula activities and laboratories, provided guest speakers, provided engineering expertise from the Naval Research Laboratory, sponsored chair professorships at NPS, promoted research at NPS through independent research and various research centers, and sponsored NPS students on their experience tours.

The NPS point of contact for the agreement is Rudolf Panholzer, chairman of the Space Systems Academic Group, rpanholzer@nps.edu.
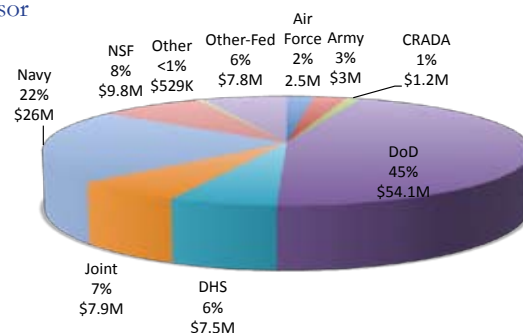
SPONSORED PROGRAMS STATUS, DECEMBER 2009
FUNDS AVAILABLE: $120.4M (INCLUDING CARRYOVER)

By Type of Activity

- Education 10% $12.2M
- Service 35% $41.7M
- Research 55% $66.4M

By Sponsor

- Navy 22% $26M
- NSF 8% $9.8M
- Other <1% $529K
- Other-Fed 6% $7.8M
- Air Force 2% 2.5M
- Army 3% $3M
- CRADA 1% $1.2M
- DoD 45% $54.1M
- DHS 6% $7.5M
- Joint 7% $7.9M

By School

- SIGS 11% $9.2M
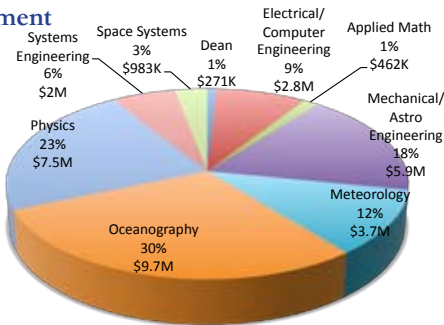- Institutes 20% $16.4M
- GSOIS 24% $19.3M
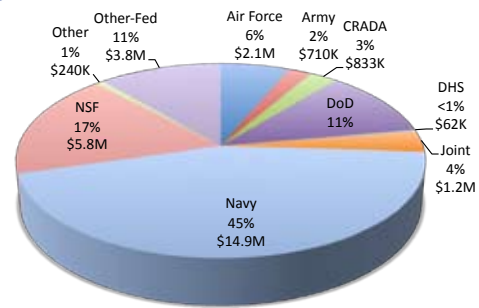- GSEAS 41% $33.2M
- GSBPP 4% $3.7M
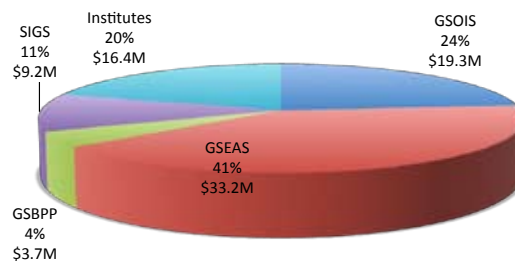
Graduate School of Engineering and Applied Sciences

Funds available to date: $33.2M

By Department

By Sponsor

Projects funded in December:

- IGBT Reliability Investigations, Todd Weatherford, ECE (ONR)
- Gallium Nitride HEMT Reliability Analysis, Todd Weatherford, ECE (AFRL)
- Wave-Current Interactions in Coastal Inlets and River Mouths, Thomas Herbers, OC (ONR)
- Modeling Wind Wave Evolution from Deep to Shallow Water, Thomas Herbers, OC (ONR)
- CeNCOOS: Environmental Monitoring in Support of Protected Marine Area Management, Jeffrey Paduan, OC (MBARI)
- New Armor Concepts Based on Fundamental Physics, Robert Hixson, PH (ONR)
- MW-Class Free Electron Laser Injector Technology Validation, John Lewellen, PH (AFRL)
- Determination of Advanced Leading Indicators of Program Technical Issues, Ronald Carlson, SE (NAVAIR)
- Model-Based Systems Engineering for the Unmanned Vehicle Sentry Architecture Development, Clifford Whitcomb, SE (ONR)
- Naval Space Systems Engineering and Acquisition Chair, Alan Scott, SP (PEO Space Systems)

School of International Graduate Studies

Funds available to date: $9.2M

By Sponsor
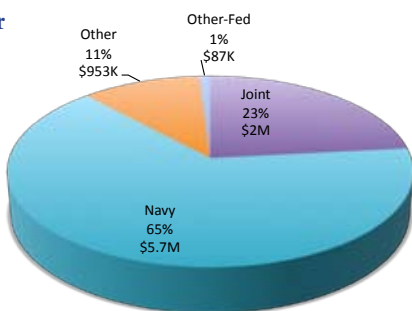
Projects funded in December:

- Support of Naval Intelligence Research and Education, CAPT Jennith Hoyt, USN, NS (ONI)
- Afghan Data Development, Thomas Johnson, NS (TRAC-Monterey)
- State and Local Fusion Center Leadership Course, Theodore Lewis, NS (DHS)
- Joint FAO Skills Sustainment Pilot Program, Tristan Mabry, NS (Defense Language Office)

Graduate School of Business and Public Policy

Funds available to date: $3.7M

By Sponsor
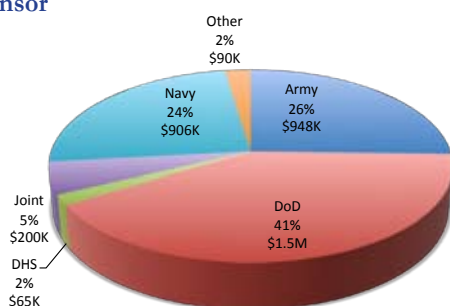
Projects funded in December:

- Advanced Acquisition Program 43-02, John Dillard, GSBPP (USAMRMC)
- DCAA Interpersonal Communications Skills Course Development, Cynthia King, GSBPP (Defense Contract Audit Agency)
- OSD Sponsored Acquisition Research Program at the Naval Postgraduate School, Keith Snider, GSBPP (OUSD AT&L)

Graduate School of Operational and Information Sciences

Funds available to date: $19.3M

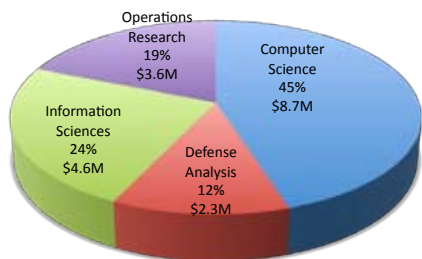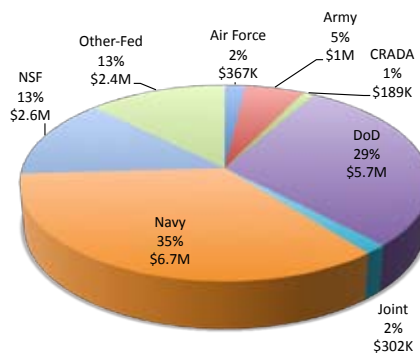**By Department**
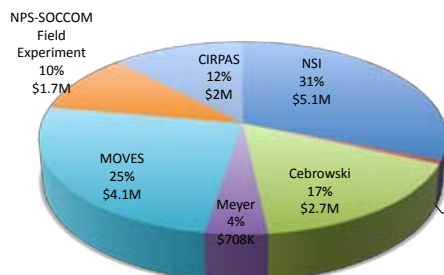

By Sponsor

Projects funded in December:

- DoD Cyber Policy Review, Simson Garfinkel, CS (OSD)
- 2010 Identity-Management Certificate Program, Cynthia Irvine, CS (Biometrics Task Force)
- Documentation-Driven Software Development, Luqi, CS (USARO)
- Trident Warrior 10: Sea Trials, Shelley Gallup, IS (NAVNET-WARCOM)
- Improving Healthcare Delivery for PTSD: An Integrated Approach Leveraging Systems Engineering and Organiza-

tional Design, Shelley Gallup, IS (VA Medical Center)
- JBAIIC, Shelley Gallup, IS (USJFCOM)
- NPS Support for CY2010-2012 Rapid Pro VIRT (RPV), Frederick Hayes-Roth, IS (USMC – MARCORSYSCOM)
- NPS Situational Awareness for Surveillance and Interdiction Operations (SASIO) Decision Support and System Analysis Tools Effort for JEFX 10-3/4, Timothy Chung, OR (NWDC)
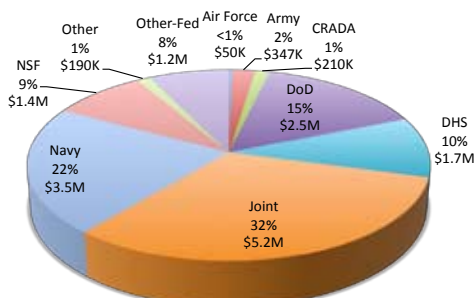
Research and Education Institutes and Centers

Funds available to date: $16.4M

By Department

By Sponsor

Projects funded in December:

- DL Certificate and OIDL Programs, Thomas Mastre, CED3 (various)
- Recognizing Patterns of Anomie that Set the Conditions for Insurgency, Karen Guttieri, GPPAG (ONR)
- Web 2.0 Information Sharing, Sue Higgins, Cebrowski (Defense Acquisition University)
- Hastily Formed Networks Support of Humanitarian Relief and SSTR Operations, Brian Steckler, Cebrowski (OSD)
- Demonstration of Aerosol Duct Sealing Technology at DoN Facilities, Fernand Marquis, Meyer (NAVFAC)
- Demonstration of Exterior Insulation Technology at DoN Facilities, Fernand Marquis, Meyer (NAVFAC)
- Critical Experiments in Condensed Matter Nuclear Science: Standard Heat M&A, Michael Melich, Meyer (DTRA)
- Human Social Cultural Behavior Program, Jeffrey Appleget, MOVES (ONR)
- Model Validation: BTRA-BC Battle Engine, Curtis Blais,

MOVES (Army Geospatial Center)
- COMBATXXI Collaboration Server, Curtis Blais, MOVES (TRAC-Monterey)
- Project Counterplay: Evaluation of Online Gaming Capabilities, Donald Brutzman, MOVES (JIEDDO)
- Display and Capture of Humans for Live-Virtual Training, Amela Sadagic, MOVES (ONR)
- Examining Tools and Methods for Assessing Network Security and Interoperability, Joseph Sullivan, MOVES (OT&E)
- Relief Star-Tides Collaboration, Ray Buettner, NPS-SOCOM (U. S. Southern Command)
- UAV Flight Testing, Bob Bluth, CIRPAS (Guided Systems Technologies)
- Desert Hawk III, Bob Bluth, CIRPAS (Lockheed Martin)
- Imagery Testing, Bob Bluth, CIRPAS (Evergreen Helicopters)
- Bat UAS Flight-Training Support, Bob Bluth, CIRPAS (Northrop Grumman)

Navy Ensign Completes Cross-Domain, Minimal-Time, Never-Been-Done Before, Classified-Thesis Project

ENS David Taweel, USN

Many at NPS will not easily forget ENS David Taweel, USN. He arrived from the Naval Academy in 2008, determined to continue his senior project in order to prove a concept for using radio-frequency signals of opportunity (SoOPs) for geopositioning of unmanned aircraft systems (UASs) independent of GPS availability.

As the title of this article suggests, Taweel completed an experimental cross-domain classified thesis project in record time with applications to many warfighting and US government communities. He dedicated hours of personal time spent in the field to prove his concept, all while successfully balancing the completion of a master's degree and electrical engineering subspecialty "p-code."

ENS Taweel not only completed a unique thesis, he raised the funding to make it happen. Reimbursable sponsors included the OSD, USSOCOM, DARPA, Joint GPS Wing, JIEDDO and the USSOCOM-NPS Field Experimentation Cooperative. Hundreds of phone calls and emails to various DoD and other government organizations resulted in the multiple sponsorship for the thesis effort.

ENS Taweel went on 21 separate TDY trips across the country to obtain funding, brief the project, conduct field work, and present final results. He was away from Monterey for 45% of the entire time working on the project. This was in addition to completing his coursework and attending every quarterly NPS-USSOCOM Field Experiment event.

Thesis field work required an initial three weeks in the field with the first failed deployment, five weeks for the second deployment, and then one and a half weeks after that to complete data collection in September. He spent another two weeks conducting a field demonstration for project sponsors and other interested organizations during the regularly scheduled fall field experiment.

It is estimated that Taweel spent over 2000 hours over the course of his fifteen months at NPS working on the project, which included over twenty-five briefings.

The result of ENS Taweel's efforts included development of performance metrics, statistical analysis of experimental data, and side-by-side comparison against other navigation and geolocation techniques currently in use.

Additional research and experiments were recommended to study the effects of clock error, propagation geometry, and environmental and atmospheric conditions. Additional recommendations were made for incorporating the developed techniques into a final, fieldable, system, along with an investigation of the potential civil and military applications for future use.

Follow-on work at both NPS and SPAWAR are planned utilizing the equipment put together by ENS Taweel. This includes a custom-built transmitter system, host flight platform, MATLAB program, receiver system and software, and a JHU/APL integrated subsystem. SPAWAR plans to take over the project and move towards getting the system to the level where the combined system is ready for acquisition.

SPAWAR's goal is to operationalize the technology. Making the system mobile will allow it to be a joint asset to be leveraged by multiple organizations for various research areas.

David Taweel is currently attending the Nuclear Power School and continues to follow the continuing work. He graduated from NPS in December 2009 with a master of science in Electrical and Computer Engineering.

ENS David Taweel and research team display unmanned aircraft prototype built to prove concept.

ENS David Taweel briefs VIPs before demonstration launch at Camp Roberts field-experiment event

New NRC Advisors

Congratulations to our new National Research Council (NRC) advisors.

John Colosi, Oceanography
Joshua Hacker, Meteorology
Arthur Krener, Applied Math
James MacMahan, Oceanography
Robin Tokmakian, Oceanography
Hong Zhou, Applied Math

Faculty interested in learning about the NRC Associateship Program may contact research@nps.edu.

Segmented-Mirror Space-Telescope Laboratory Officially Opens

Major General Pawlikowski with new Segmented-Mirror Space Telescope

Major General Ellen M. Pawlikowski, USAF, deputy director of the National Reconnaissance Office (NRO), joined Provost Leonard Ferrari, VP for Research Karl van Bibber, and Distinguished Professor Brij Agrawal for the opening of the Segmented-Mirror Space-Telescope (SMT) Laboratory.

The SMT was developed by the NRO as a test bed for imaging-telescope technologies. The NRO, which designs, builds, and operates the nation's reconnaissance satellites, has completed development and testing of the telescope and transferred the test bed to NPS to support academic research. NPS has created a new lab to house the telescope in Halligan Hall under the Department of Mechanical and Astronautical Engineering, Graduate School of Engineering and Applied Sciences.

Distinguished Professor Brij Agrawal, director of the Space Research and Design Center

The new asset will be used in the space-systems engineering and operations curricula to provide experience in the design, analysis, and testing of space systems and to offer facilities for experimental research.

The Naval Postgraduate School's Space Research and Design Center, of which Agrawal is director, will conduct collaborative research using the SMT with national laboratories, industry and other universities.

The SMT will increase NPS research capabilities in target acquisition, tracking, and pointing of flexible spacecraft with optical payloads; adaptive optics for correction of optical aberrations due to mirror surface errors and turbulence; active vibration and jitter control, and space-system design.

NPS Research Featured in American Journal of Physics

Research by professors Bruce Denardo and Andres Larraza and LT Joshua Puda, USN, was featured as the cover and lead story in the *American Journal of Physics'* December 2009 issue. The abstract is reprinted below.

A WATER-WAVE ANALOG OF THE CASIMIR EFFECT
Bruce C. Denardo, Joshua J. Puda, and Andres Larraza
Department of Physics, Naval Postgraduate School
Abstract: Two rigid plates are vertically suspended by thread such that they are parallel to and opposite each other. The plates are partially submerged in a dish of liquid that is attached to the top of a vertical shake table. When the shake table is driven with noise in a frequency band, random surface waves are parametrically excited, and the plates move toward each other. The reason for this attraction is that the waves carry momentum, and the wave motion between the plates is visibly reduced. The behavior is analogous to the Casimir effect, in which two conducting uncharged parallel plates attract each other due to the zero-point spectrum of electromagnetic radiation. The water wave analog can be readily demonstrated and offers a visual demonstration of a Casimir-type effect. Measurements of the force agree with the water wave theory even at large wave amplitudes, where the theory is expected to break down. The water wave analog applies to side-by-side ships in a rough sea and is distinct from the significant attraction that can be caused by a strong swell.

Associate Professor Bruce Denardo, Physics

American Journal of Physics, *Volume 77, No. 12, December 2009.*

Associate Professor Andres Larraza, Physics

THE DHIMMI NARRATIVE: A COMPARISON BETWEEN THE HISTORICAL AND THE ACTUAL IN THE CONTEXT OF CHRISTIAN–MUSLIM RELATIONS IN MODERN EGYPT

Gianstefano C. Martin, Chaplain, Major, United States Army
B.A., University of Michigan, 1980
Master of Public Health, City University of New York, 1987
Master of Divinity, University of the South, 1993
Master of Religious Studies (Islam), University of Virginia, 2007
Master of Arts in National Security Affairs–December 2009
Advisor: Mohammed Hafez, Department of National Security Affairs
Second Reader: Abbas Kadhim, Department of National Security Affairs

Religious texts, narratives, and history often provide the template by which religious leaders and their communities of faith frame actual events in modern times. In 2007, while conducting interviews in Egypt with leading figures from the Muslim and Christian communities, the author noted frequent comparisons, both favorable and unfavorable, between the dhimmi experience lived by Christians as separate millets in the past to describe the present conditions of the sizeable Christian minority living in Egypt today. This thesis investigates to what extent the parallels and analogies between the past and the present are valid and illuminating, and to what extent they are actually confounding, conflating, and obfuscating what is really going on. After identifying the hallmarks of the historical system by which the dominant Muslim authority managed its religious minorities in terms of spirit, ethos, and practice, there follows a comparison of the main characteristics of the historical experience based on chronicles of Christians living as citizens in the modern Egyptian state. The thesis argues that although the origins of some current practices can be validated in some particulars, the dhimmi narrative as analogy is largely essentialism, and a rhetorical device, largely because it lacks the systemic, discriminatory intentionality and application exemplified by the millet system. As a way of understanding historical connections between the present and the past it has limited and circumscribed utility. Deployed as narrative or analogy by which to make meaning out of the present, it reinforces stereotypes, confounds attempts at conflict resolution, and infuses the future with an unwarranted sense of pre-ordained path determinacy. It leaves much to be desired as a useful analogy, but is useful in terms of developing taxonomy of attitudes and positions regarding the place of Christians in today's Egyptian state. *MAJ Martin received the Association of the United States Army, General Joseph W. Stillwell Chapter, Award for Outstanding Army Student.*

ANALYSIS OF THE RELATIONSHIPS AMONG TRUST ANTECEDENTS, ORGANIZATIONAL STRUCTURES, AND PERFORMANCE OUTCOMES

Joseph T. Seykora–Captain, United States Marine Corps
Master of Science in Management–December 2009
Lead Advisor: Edward H. Powley, Graduate School of Business and Public Policy
Support Advisor: Mark E. Nissen, Department of Information Sciences

The project explores and seeks to identify relationships among four trust antecedents, two organizational structures, and two performance outcomes. The results will help to further explain associations between trust level (high or low) and organizational structure. Past research found that the edge organization operating in a high trust environment produces the most accurate results in the least amount of time. Additionally, the research found that accuracy performance in the rigid hierarchy was more resilient than the flexible edge structure to changes in trust level.

What has yet to be determined is the extent to which factors leading to perceived trust, also known as "trust antecedents," are responsible for performance in a given structure. To empirically study these relationships, the present research analyzes data collected during an ELICIT simulation experiment involving 135 subject responses. The objective of this project is to identify relationships among the trust antecedents (competence, openness, concern, and reliability), organizational structure (edge and hierarchy), and performance (speed and accuracy).

Benefits of this research include recommendations for program/project managers of integrated product teams in defense-acquisition programs who desire to optimize team performance by addressing trust antecedents or organizational structure. In doing so, managers can make more informed decisions regarding team member organization and trust in order to more accurately and rapidly achieve organizational objectives. *Capt Seykora received the Marine Corps Association Superior Service Award for Outstanding U.S. Marine Student.*

PROCEDURES FOR INTERPRETING AND VISUALIZING BLUE-FORCE TRACKER DATA (U)

Charles W. Weko III–Major, United States Army
B.S., Rose-Hulman Institute of Technology–June 1995
Master of Science in Operations Research–December 2009
Advisor: Lyn R. Whitaker, Department of Operations Research
Second Reader: David L. Alderson, Department of Operations Research

(U) Blue-force tracker (BFT) data records signals of transponders installed in blue-force vehicles and aircraft. BFT data, the sole archived global blue-force presence data, is stored in large, cumbersome, undocumented text files making objective analysis of blue-force activity difficult. We introduce techniques for efficiently structuring BFT data so that blue-force activity can be rapidly reconstructed by operational analysts. We also introduce tools for visualizing blue-force activity in time that are accessible and can be easily interpreted by analysts and warfighters directly involved in combat operations. We use these techniques to characterize typical blue-force moment and extract information about groups of vehicles operating on the battlefield. Grouping vehicles using the new BFT data structures yields more information while compensating for BFT data limitations. We uncover subtleties of the BFT data of which analysts must be cognizant. We also apply the techniques to recreate blue-force activity surrounding a recent improvised, explosive device event in Afghanistan.

(U) Together, these techniques give the warfighter and the analyst powerful insights into blue-force activity and the interaction between these activities and enemy actions. *MAJ Weko received the NPS Outstanding Academic Achievement Award for Department of Defense Student and the Military Operations Research Society Stephen A. Tisdale Graduate Research Award.*

COOPERATIVE RESEARCH AND DEVELOPMENT AGREEMENTS (CRADAS)

ADVANCED TECHNOLOGY INTEGRATION AND ASSESSMENT FOR WARFARE EFFECTIVENESS
Partner: Northrop Grumman
NPS POC: Giovanna Oriti and Young Kwon, Meyer Institute
Summary: The objective is to develop technologies and concepts of operations in naval and marine systems to improve future war-fighting missions. Focus will include a) shipboard electric-systems-modeling engineering for feasibility assessment of hybrid electric-drive systems and reduced operational fuel consumption and b) carbon-nanotube-enhanced fluid-technology characterization for high-power electric-system cooling fluid, for speed of light engagement.

COMMAND AND CONTROL TRAINING SYSTEM RESEARCH AND DEVELOPMENT
Partner: EADS North America, Inc.
NPS POC: Anthony Ciavarelli, MOVES Institute
Summary: The partners will develop a software framework and visualization platform for doctrine validation and training. The result will address critical military and civilian needs in managing responses and validating existing standard operating procedures in symmetric attacks and natural- or man-made disaster scenarios.

TECHNICAL SERVICE AGREEMENTS

NPS will provide preflight coordination, range management, and flight safety and facility management to various companies while conducting flight testing at the Center for Interdisciplinary, Remotely-Piloted Aircraft Studies (CIRPAS).

The NPS POC for all projects listed is Robert Bluth of CIRPAS.

- **Project: BAT UAS FLIGHT-TESTING SUPPORT**
  Customer: Northrop Grumman
- **Project: UAV FLIGHT TESTING SUPPORT**
  Customer: Guided Systems Technologies, Inc.
- **Project: IMAGERY TESTING SUPPORT**
  Part ner: Evergreen Helicopters, Inc.
- **Project: DESERT HAWK III SUPPORT**
  Partner: Lockheed Martin

PATENT AWARDED

AUTOMATIC CLOCK SYNCHRONIZATION AND DISTRIBUTION CIRCUIT FOR COUNTERCLOCKWISE-FLOW, PIPELINED SYSTEMS, Patent Number: 7,627,003
Inventors: Douglas Fouts, ECE, CDR Brian Luke, USN

TECHNICAL REPORTS PUBLISHED

NPS-OC-09-009	Physical, Nutrient, and Biological Measurement of Coastal Waters off Central California in January 2009	T. Rago, R. Michisaki, B. Marinovic, M. Blum, K. Whitaker
NPS-OR-09-004	Game-Theoretic Models for Jamming Radio-Controlled, Improvised, Explosive Device	K. Lin
NPS-SE-09-008	Advanced Sea-Base Enabler (ASE) Capstone Design Project	E. Bjorkner, J. Brennan, R. Brooks, L. Flitter, E. Igama, M. Martini, et al.
NPS-SE-09-012	Modeling and Simulation Education for the Acquisition and T&E Workforce: Final Report	D. Olwell, H. Johnson, J. Didoszak, S. Few
NPS-SE-09-013	Functional Gap Analysis of the Maritime Operations Centers	Von Beaty, Yonatan Berhane, Lei Chen, John C. Hunt, et al.
NPS-SE-09-014	System Architecture for Anti-Ship Ballistic Missile Defense	J. Hobgood, K. Madison, et al.
NPS-SE-09-015	Maritime Domain Awareness: C4I for the Thousand-Ship Navy	M. Agnello, J. Astudillo, J. Brown, M. Jauregui, B. Korikorian
NPS-SE-09-016	Integrated Electronic Warfare Systems Aboard the United States Navy's 21st Century Warship	N. Andrews, G. Gamboa, R. Smith, M. Artelt, S. Hentges, D. Wright
NPS-GSBPP-09-017	The Evolving Private Military Sector: Toward a Framework for Effective DoD Contracting	N. Dew, I. Lewis
NPS-GSBPP-09-023	Dynamic Cost-Risk Assessment for Controlling Cost of Naval Vessels	E. Kujawski, D. Angelis
NPS-GSBPP-09-024	An Analysis of the Future-Combat Systems Spin-Out 1 Low-Rate-of-Initial-Production Contract	A. Laverson, J. San Miguel
NPS-IS-09-001	Dynamic Fit and Misfit through Organizational Design: Conceptualization via Stability and Maneuverability	M. Nissen

Technical reports may be obtained at http://www.nps.edu/Research/TechReports.html

BASE-IT Project Briefed to Commander, US Joint Forces Command

Research Associate Professor Amela Sadagic of the Modeling, Virtual Environment and Simulation (MOVES) Institute, along with several colleagues from MOVES and the NPS Computer Science Department, have been working with two other institutions, UNC Chapel Hill and Sarnoff Corporation, on the BASE-IT (Behavior Analysis and Synthesis for Intelligent Training) project. This research effort, sponsored by the Office of Naval Research (ONR) with PM TRASYS (Program Manager, Training Systems) and TECOM of the US Marine Corps as the transition customers, is aimed at developing a state-of-the art intelligent training system that enables automated capture, evaluation, and visualization of a unit's performance on physical ranges used in urban warfare training.

During the first week of December, Sadagic, BASE-IT principal investigator, her colleagues, and two NPS

Gen James N. Mattis, USMC, and research team watch demo of virtual sand table use in unit mission planning by Maj Matthew Denney, USMC (Ret.)

students, Maj Benjamin Brown, USMC, and Capt Aaron Burciaga, USMC, attended the I/ITSEC conference, the largest modeling and simulation conference in the military domain.

The BASE-IT team presented the results of their research efforts in two conference papers and demonstrated different segments of their work on the exhibition floor. During the conference, the

BASE-IT team, left to right: Henry Fuchs (UNC), Herman Towles (UNC), Greg Welch (UNC), Amela Sadagic (NPS), Maj Benjamin Brown, USMC (NPS) and Capt Aaron Burciaga USMC (NPS). The BASE-IT team was hosted by PM TRASYS in the USMC booth on the I/ITSEC exhibition floor. During the conference week, the team demonstrated selected results of their work: the virtual sand table (UNC), a behavioral analysis and 2-1/2D visualization system (Sarnoff), and a 3D visualization system and planning tool (NPS).

BASE-IT project team had the opportunity to meet with General James N. Mattis, Commander, US Joint Forces Command. Sadagic provided a short overview of the effort and emphasized the relevance of the team's research and its application to USMC training on ranges for urban warfare. This briefing was followed by a demonstration of the virtual sand table provided by Maj Matthew Danney, USMC (Ret.) of PM TRASYS, who also serves as the main subject-matter expert for the project. The same demonstration of the team's work was presented to congressional visitors led by representatives J. Randy Forbes and Suzanne Kosmas.

For more information on BASE-IT check http://www.move-sinstitute.org/base-it .

Student Research, continued

INFLATION OF USAF OFFICER-PERFORMANCE REPORTS: ANALYZING THE ORGANIZATIONAL ENVIRONMENT

Stephane L. Wolfgeher–Major, United States Air Force
B.S., Colorado State University, May 1995
Master of Aeronautical Science, Embry-Riddle Aeronautical University, June 2008
Master of Science, Naval Postgraduate School, December 2009
Advisor: Erik Jansen, Department of Defense Analysis
Second Reader: Brian Greenshields, Department of Defense Analysis

The Air Force officer-evaluation system's purpose is to provide feedback, document a record of performance and potential, and provide centralized selection boards sound information for decision making. Officer performance reports are, and have historically been, considered inflated. This research assumes inflation is counter to the purpose of the evaluation system and investigates why historical inertia towards inflation exists. This is done by viewing the evaluation system as an open system and using organization, behavior, evaluation, and game theory to analyze organizational structure, culture, rewards, people, and tasks in U.S. military systems to identify elements that contribute to or inhibit inflation. The structure of the military, military culture, and the role of performance evaluations in the promotion and reward systems all directly support inflation. Changing the evaluation form reduces inflation in the short term, but a whole-systems approach must be taken to combat inflation in the long term. While some elements are unlikely to change only to reduce inflation, the analysis suggests the tool must be changed to permit rater accountability, the culture must be altered to accept accurate evaluations, and small changes in structure and reward systems might be made to reduce the long-term tendency of evaluation inflation. *Maj Wolfgeher received the Air Force Association Award for Outstanding U.S. Air Force Student.*

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