



WELCOME TO THE FEBRUARY/MARCH 2014 EDITION of the M&S Newsletter. This issue presents articles ranging from maximizing the educational value of virtual training to the design process of the velodrome used in the London 2012 Olympic games. Additional articles feature a new simulation and game institute at George Mason University, simulation based training, combat convoy simulator training, and the U.S. Air Force demonstrating energy resiliency in a mission critical environment. Please note that the complete or original articles are available through the links provided.

We hope the February/March 2014 M&S Newsletter provides valuable insight into the world of M&S and we welcome your comments.

—M&S Newsletter Staff

Mission Possible: Simulation-based Training and Experimentation on Display

Photo Credit: Office of Naval Research



A UNIQUE SYSTEM THAT MERGES THE VIRTUAL AND REAL WORLDS to train sailors for combat scenarios was unveiled December 2 in Orlando, FL.

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Mission Possible: Simulation-based Training and Experimentation on Display

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Detailed in a new video produced by Office of Naval Research (ONR), Fleet Integrated Synthetic Training/Testing Facility (FIST2FAC) provides an affordable, adaptive way to train. It combines a hassle-free setup, software, and gaming technology to help naval forces develop strategies for a variety of missions and operations.

“This is the future of training for the Navy,” said Dr. Terry Allard, head of ONR’s Warfighter Performance Department. “With simulation, you can explore endless possibilities without the expense and logistical challenges of putting hundreds of ships at sea and aircraft in the sky.”

FIST2FAC allows sailors to interact with artificially intelligent forces in countless settings and train for multiple missions simultaneously. The system can replicate simple and complex situations involving aircraft carriers, helicopters, lethal and nonlethal weapons, and more.

A recent scenario demonstrated at Ford Island, HI, pitted a ship’s crew against several fast-attack craft in waters

crowded with merchant traffic. Sailors quickly determined the boats to be hostile and engaged them with machine-gun fire from the virtual ship.

“FIST2FAC allows sailors to ‘train like they fight’ by presenting realistic forces in a visual, tactical and operational environment,” said Glenn White, ONR’s integration and transition manager for the project.

Swarming attack boats is one of several tactics Navy leaders hope to overcome through an Anti-Access/Area Denial (A2/AD) strategy to counter threats from adversaries trying to restrict the access and movement of U.S. forces.

“A2/AD is a really challenging problem,” Allard said. “With simulation, we can help the experts be more innovative in defining what tactics, techniques and procedures will go into a successful A2/AD strategy.”

This article originally appeared on the Office of Naval Research website. For complete article, [click here](#).

George Mason and Prince William County Open Doors to New Simulation and Game Institute

GEORGE MASON UNIVERSITY AND PRINCE WILLIAM COUNTY will officially open the doors to a new Simulation and Game Institute (SGI) located on George Mason’s Prince William Campus within Innovation Park.

SGI serves as the applied research, business development, and corporate education arm of the Computer Game Design Program. The new location serves as one of four international affiliates of the SGI, which is an operating division of Coventry University in England. Other affiliates include locations in Singapore, South Africa, and Mexico.

The 4,000-square-foot facility will offer cutting-edge game design research and development, simulation and game training and certification; visualization and simulation

software development and rapid-prototyping. The facility will also provide offices, studios, research space, and a product development lab for individuals, entrepreneurs, and companies in the field of simulation, modeling and game design.

The space will also provide access to leading commercialization and marketing channels; student development talent; research faculty; industry experts; mentors; business counseling support; and the potential of financial investment from foundations and equity partners

This article originally appeared on the George Mason University website. For complete article, [click here](#).



Air Force Researchers Demonstrate Energy Resiliency in Mission Critical Environment

ENERGY SECURITY IS CRITICAL TO THE AIR FORCE'S WARFIGHTING CAPABILITY. The 2013 Air Force Energy Strategic Plan identified priorities and goals to secure a strategic energy advantage. These included resilience, demand reduction, supply assurance, and an energy-aware culture.

The Air Force Research Laboratory's (AFRL) Advanced Power Technology Office (APTO) is working to achieve these goals through coordinated research efforts that address energy concerns while maintaining mission readiness.

An APTO collaboration with the Air Force Space Command (AFSPC) leverages a Research, Development, Test, and Evaluation (RDT&E) program to enhance solutions to improve the facility's energy security.

AFSPC's 10th Space Warning Squadron (SWS) at Cavalier Air Force Station (AFS), ND, operates and maintains one of the world's most capable phased-array radar systems. The Perimeter Acquisition Radar Attack Characterization System (PARCS) provides critical missile warning and space surveillance data to the Joint Space Operations Center (JSPOC) and the North American Aerospace Defense Command (NORAD). PARCS monitors and tracks more than half of all earth-orbiting objects to enable space situational awareness and control. Additionally, 10th SWS provides attack characterization data to the Secretary of Defense and the President for real time war plan execution decisions.

Energy reporting completed in 2012 indicated AFSPC was below the Air Force's 2015 energy intensity goal and was trending down compared to the previous year. To meet the objectives of the 2013 Air Force Energy Strategic Plan and the mission's operational requirements, AFSPC decided to focus on improving operational resiliency at Cavalier AFS by implementing technologies aimed at improving the installations energy efficiency.

Working together, APTO and the 10th SWS completed a site assessment concentrating on opportunities to reduce energy

consumption and costs. After assessing the operational constraints of the facility, APTO recommended process energy improvements by using an Integrated Environmental Solutions Virtual Environment (IESVE) model to perform realistic simulations of energy improvement options and validate their performance.

Specifically, APTO concluded the best investments to bolster the AFSPC's mission for energy reliance includes:

- Installing a free cooling heat exchanger to provide waterside economizing to the space surveillance operations center.
- Replacing the existing cooling water pumps with variable speed pumps and controls to allow the coolant flow rate to dynamically adjust in response to radar system load.
- Replacing the terminal reheat coils with variable air volume (VAV) controllers and installing variable frequency drives (VFD) on the supply air fans to reduce the required airflow and provide VAV optimized temperature control for the missile warning system.

This article originally appeared on the Wright-Patterson Air Force base website. For complete article, [click here](#).

M&S Newsletter

Have an M&S related question or want to comment on the M&S Newsletter? Email the Ask M&SCO Help Desk at: osd.pentagon.ousd-atl.list.msco-ask-msco@mail.mil.





■ ■ ■ London 2012 Velodrome: The Role of Simulation in the Design Process

Photo Credit: Wikipedia



WHILST STADIA PREPARATIONS FOR THE UPCOMING 2014

Winter Olympics in Sochi, 2014 Fédération Internationale de Football Association (FIFA) World Cup in Brazil, and 2022 FIFA World Cup in Qatar come under intense scrutiny, we look back at how the 2012 Summer Olympics in London got it right—by incorporating simulation into the design process of the highly acclaimed velodrome.

The London 2012 velodrome achieved the environmental standards rating ‘BREEAM Excellent’ at the design stage. The article “London 2012 Velodrome -- integrating advanced simulation into the design process,” by Harries, Brunelli, and Rizos, published in *Journal of Building Performance Simulation*, presents the simulations carried out during the London 2012 velodrome design process. It illustrates how the methodology informed the key design decisions that were made.

According to the authors, success of the velodrome is held in the integration of advanced simulation practices into the design process, they believe success lies in the existence of three competences: simulation competence—creation of a simulation fitting the brief; integration competence - assimilation of the simulation into the working architectural

design; and holistic design competence—use of architectural design, environmental engineering, and service concepts to meet the project Key Performance Integrators (KPI’s).

Throughout the concept, design process simulations were used to ensure that the finished velodrome met the KPI’s set, whilst maximising visual, environmental, and functional potentials. Environmental design determined the building form to increase aerodynamics, ventilation, and reduce volume. Air flow simulations were used to enable the build to use natural air flow ventilation, the bowl shape of the building supplementing this to produce more airflow driving-force. Winter heating feasibility simulations were used to ensure a well-mixed thermal environment with target temperatures maintained throughout. Computational fluid dynamics was used to ensure natural ventilation enabled efficacy in reaching suitable environmental temperatures and on-track air velocity criteria during summer.

*“London 2012 Velodrome – integrating advanced simulation into the design process,” by Alan Harries, Gustavo Brunelli, and Ioannis Rizos, *Journal of Building Performance Simulation*, published by Taylor & Francis. For complete article, [click here](#).*



Virtual Training: Marines Conduct Combat Convoy Simulator Training

Photo Credit: Cpl. Timothy Childers



Marines with 7th Engineer Support Battalion, 1st Marine Logistics Group, conduct Combat Convoy Simulator (CCS) training aboard Camp Pendleton, CA, November 21. The CCS is a virtual reality training aid that provides an immersive environment and simulates the operation of tactical vehicles in convoy operations.

MARINES FROM 7TH ENGINEER SUPPORT BATTALION, 1ST MARINE LOGISTICS GROUP, take advantage of training provided by the Combat Convoy Simulator (CCS) aboard Camp Pendleton, CA, November 21. The CCS is a virtual reality system that provides an immersive environment and simulates the operation of tactical vehicles in convoy operations.

The CCS center has multiple rooms outfitted with replicas of military vehicles with mounted weapons, surrounded by screens. A computer program simulates different geographic locations and artificial intelligence characters with behavior that changes according to actions the convoys take.

“You’re in the actual hull of a Humvee or 7-ton and surrounded by screens to run the simulation,” said Sgt. Michael Solis, squad leader, 1st Platoon, Bravo Company,

7th Engineer Support Battalion, 1st Marine Logistics Group. “You have weapons that work. You have [communications] that work. It’s a pretty realistic simulation of what you’re getting into. It’s about as real as you’re going to get without going to theater.”

The CCS is just another tool Marines are adding to their toolkit of training aids, using advances in technology to train in the most efficient and effective methods. The Marine Corps has already adopted a similar system for learning weapon systems. The Indoor Simulated Marksmanship Trainer uses some of the same technology to train Marines on a simulated firing range.

This article originally appeared on the U.S. Marine Corps website. For complete article, [click here](#).



Military Seeks Ways to Maximize Virtual Training's Educational Value

WHILE THE SIMULATION INDUSTRY OFTEN FOCUSES ON INCREASING THE FIDELITY OR GRAPHICS OF ITS PRODUCTS, the military's science and technology community is hunting for ways to increase their effectiveness, allowing troops to learn more at a faster pace.

The services need to measure how much an individual can learn in a simulation, officials said December 4 at the Interservice/Industry Training, Simulation and Education Conference. Most of them did not provide examples of specific technology areas that the military plans to invest in, but all agreed on the need for products that accelerate learning and increase retention.

"The military must ensure that the technologies they seek out are a good fit for the task at hand," said Vice Adm. David Dunaway, head of Naval Air Systems Command. Some applications of simulation — such as the Navy's new video game-based training for the littoral combat ship — are effective ways to teach sailors new information.

But it's not one size fits all, Dunaway warned. For instance, certain Navy training, which had traditionally taken 15

minutes to complete, was recently replaced by game-based learning where "you have to listen to the full hour of this avatar droning on to you about personal safety," he said. "It's a misapplication of this technology."

"The Navy is seeking interoperable and distributive technologies that can be used all over the globe and during exercises with other services," said Chief of Naval Research Rear Adm. Matthew Klunder.

"The Army wants not only that, but it also seeks systems that can be individualized to different learning styles instead of always conforming to a standard human being," said Thomas Russell, director of the Army Research Laboratory.

"It's too expensive to not standardize the material, but when it comes to training, when it comes to representation of information ... there's a force multiplier here that we have to figure out how to take advantage of, and that's how we all function individually and how we maximize our own abilities to learn and to be trained," he said.

This article originally appeared on the National Defense Magazine website. For complete article, [click here](#).

M&S Journal

The latest issue of the *M&S Journal* is available now and focuses on M&S Reuse. You can download a copy and access all the previous issues of the *M&S Journal* at:

<http://msco.mil/MSJournal.html>.





FEATURED HIGH LEVEL TASK

High level tasks are special technology-related projects that will enhance the applications of M&S throughout the DoD for the benefit of our Warfighters. By focusing on the goals stated in the “Strategic Vision for DoD Modeling and Simulation,” these high level tasks are delivering solutions that will contribute to closing fundamental gaps in current M&S capabilities.



DoD M&S Successes in FY13

THE DEPARTMENT OF DEFENSE (DOD) MODELING AND SIMULATION COORDINATION OFFICE (M&SCO)'S MISSION

involves advocating for and improving modeling and simulation (M&S), within and beyond the Department. Much of M&SCO's efforts help guide DoD toward reusable and interoperable M&S tools (i.e., tools that work among differing organizations and technologies).

Throughout the past fiscal year, M&SCO has continued to sponsor modeling and simulation projects and achievements that have advanced DoD's M&S mission. Many of these M&SCO-funded projects resulted in technical products and standards that enabled collaboration and enterprise efficiencies. Two notable successes in technology, standards, and policies last year include the Cyber Operations Research and Network Analysis (CORONA) and Integrated Threat Analysis Simulation Environment (ITASE):

- CORONA is a capability that promotes uniform test/experiment design, control, and analysis in a distributed simulation environment; reduces overall sustainment and operations and maintenance (O&M) requirements; and provides operationally realistic cyberspace test and experimentation environments.
- ITASE facilitates integration of up-to-date, authoritative threat models system representations at the model and simulation level through a well-defined interface. It leverages the existing Intelligence Production Center's investments in threat weapon system M&S.

M&SCO has also highlighted DoD M&S successes in back issues of the M&S Newsletter. You can find detailed information about the earlier successes using the following links:

- The M&S Catalog was transformed in FY2013. More information can be found in our **October/November 2013 issue**.
- Live-Virtual-Constructive M&S standards—Information is found in the **October/November 2013 issue**.
- Rapid Data Generation (RDG)—Information is located in the **December/January 2014 issue**.

To discover more about these recent successes that help support the M&S Enterprise's needs, or for additional information, visit www.msco.mil.

From our site, users will find an easy link in the upper right corner to "Ask M&SCO" about any of our tools and capabilities. The direct email address is

osd.pentagon.ousd-atl.list.msco-ask-msco@mail.mil.

You may also telephone us at 1-888-566-7672.



M&S WHAT AND WHEN

MODELING & SIMULATION CALENDAR OF EVENTS

SEDC 2014 Conference

April 3 – 5, 2014
Chantilly, VA

15th Annual Science & Engineering Technology Conference/Defense Tech Exposition

April 8 – 10, 2014
Hyattsville, MD

MODSIM World 2014

April 15 – 17, 2014
Hampton, VA

AlaSim International

May 6 – 7, 2014
Huntsville, AL

ITEC

May 20 – 22, 2014
Cologne, Germany

2014 SOFIC (Special Operations Forces Industry Conference)

May 20 – 22, 2014
Tampa, FL

82nd MORS Symposium

June 16 – 19, 2014
Alexandria, VA

32nd International Conference of the System Dynamics Society

July 20 – 24, 2014
Delft, Netherlands

2014 Pacific Operational Science and Technology Conference

August 26 – 29, 2014
Honolulu, HI

2014 Fall Interoperability Workshop (SIW)

September 8 – 12, 2014
Orlando, FL

17th Annual Systems Engineering Conference

October 27 – 30, 2014
Arlington, VA

I/ITSEC 2014: Interservice/Industry Training, Simulation & Education Conference

December 1 – 4, 2014
Orlando, FL



The M&S Newsletter

The M&S Newsletter is a DoD Modeling and Simulation Coordination Office (M&SCO) bi-monthly publication that provides information concerning interesting M&S developments, articles, and a calendar of events for the M&S community.

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