



Welcome to the November/December 2010 edition of the Modeling and Simulation Information Analysis Center (MSIAC) M&S Newsletter. This issue presents a variety of M&S articles and events from communities enabled by M&S within the Department of Defense and beyond. We hope you enjoy the November/December edition and look forward to your comments.

Although the wordings in the excerpts may not always correspond to official DoD usage, the full articles available through the links provided offer valuable insights into the applications of technologies throughout the M&S community.

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## **ISSUE SPOTLIGHTS**

### **2010 Army M&S awards**

**Synthetic amphibious exercise**

**Unmanned aircraft simulators**

**New automobile driving simulators**

**Medical simulation centers**

**Simulation supporting veteran rehab**

**Simulating biomineralization**

**DoD MSSOC courses for 2011**

**M&S Journal accepting technical papers**

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The following article on the Army M&S Awards, was submitted by Mrs. Betty L. Jones, the Army M&S Coordinator.

## **2010 ARMY AND MODELING AND SIMULATION AWARDS**

The Army Modeling and Simulation Office (AMSO) recently announced the winners for the 2010 Department of the Army Modeling and Simulation (M&S) Awards. "M&S in Restoring Balance and Setting the Conditions for the Future of the Army" was the theme for this year's awards.

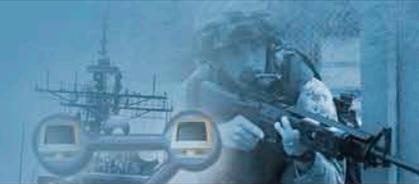
Since 2003 AMSO has conducted this program to acknowledge superior contributions in modeling and simulation efforts across the Army in the categories of Acquisition, Analysis, Experimentation, Testing, Training, Plans and Operations, and Cross-Cutting disciplines; this year nominations were also solicited from the Intelligence community. 57 nominations were received, reviewed and rated based on criteria including how well the submission supported the theme and what benefits were, or will be, realized by the Army because of these efforts. Individual and team efforts were considered in each category.

The awards were presented by Dr. Robert Steinrauf, SES, Technical Director, Center for Army Analysis, on 30 November 2010 at the Interservice/Industry Training, Simulation & Education Conference (I/ITSEC) in Orlando, FL.

Details on the winning submissions can be found at: <http://www.ms.army.mil/about/awards/FY10-awardWinners-list.html> on the AMSO home page. For further information or details, contact Mrs. Betty Jones of the Army Modeling and Simulation Office at [betty.jones2@us.army.mil](mailto:betty.jones2@us.army.mil).

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*The following article on an amphibious exercise, originally appeared on the U.S. Department of Defense (DoD) website.*

## **MARINES, NAVY TO CONDUCT SYNTHETIC AMPHIBIOUS EXERCISE**

WASHINGTON, Dec. 6, 2010 – For nearly a decade the Marines have been heavily involved in land-locked battles in Iraq and Afghanistan. Now, the Marine Corps' II Marine Expeditionary Force is teaming up with the U.S. Navy's Second Fleet for Exercise Bold Alligator 2011, a synthetic training exercise that will test the Marines' famed amphibious capabilities. Commander, Expeditionary Strike Group Two, and Commander, 2nd Marine Expeditionary Brigade in coordination with ships assigned to the U.S. Navy's Second Fleet will conduct a joint large-scale fleet synthetic amphibious exercise concentrating on the fundamental roles as "fighters from the sea."

The synthetic exercise, which Owens says will "make extensive use of modeling and simulation in an effort to simulate weather, battlefield conditions, and force-on-force opposition," will focus on the command element in order to replicate live combat situations. Exercise Bold Alligator 2011 also serves as a test run for a planned live exercise in 2012.

"It's the first brigade-level amphibious exercise on the East Coast in nearly ten years, but it's also a first step in our revitalization of our amphibious proficiency," Brig. Gen. Christopher Owens, deputy commanding general, 2nd Marine Expeditionary Force, Marine, said during a "DoDLive" bloggers roundtable Dec. 2.

"During the exercise, we plan to refine our current concepts involving sea-basing, forcible-entry operations, and command-and-control," because "so much of what the U.S. does, in terms of international security, relies on amphibious access to areas of conflict," he explained.

Owens alluded to Navy assault amphibious ships like USS Iwo Jima, USS Tarawa, and USS Inchon as to how amphibious operations have been perceived, but was quick to point out that not all amphibious operations are assaults. In fact, of the 100 amphibious operations that have taken place in the last 20 years, many were non-combat situations like disaster response, noncombatant evacuations, and humanitarian assistance.

Although numerous military analysts have thought amphibious operations to be obsolete, time and again they have proven their worth in a variety of combat situations -- including possible pre-emptive action. This is why planners for the exercise are working to refine emerging amphibious concepts and improve amphibious operations overall.

For complete article from the U.S. Department of Defense, click [here](#).

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*The following article concerning simulators for unmanned aircrafts, originally appeared in the National Defense Magazine.*

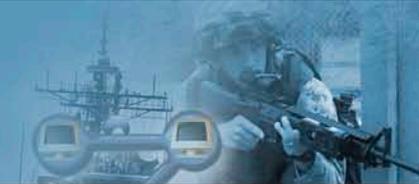
## **GREATER APPETITE FOR UNPILOTED AIRCRAFT IN COMBAT ZONES FUELS DEMAND FOR SIMULATORS**

The growing demand for unmanned spy aircraft in combat zones has increased the burden on training organizations that are being asked to produce more operators, and faster.

But schoolhouses in the United States are finding it increasingly difficult to train unmanned air vehicles pilots because of their restricted access to the national airspace.

As a result, UAV operators are logging more flight hours in "synthetic" skies where mistakes can be corrected and the airspace is endless. In high-fidelity video games, more military personnel are now learning how to fly UAVs and operate the aircraft sensors.





The influence of video games has reached Fort Huachuca, Ariz., and other locations where students learn to operate the military's drones. By the end of 2012, the armed forces will operate more than 250 classrooms for PC-based military training.

The simulation industry is taking note.

"W, A, S, D," said Brad Johnson, who develops UAV training solutions for General Dynamics Information Technology. "Look at who we're targeting and the generation coming up."

Recruits know from playing games that those letters represent the computer keys needed to move forward, left, backwards and right, Johnson said.

With the Pentagon looking to shave costs at nearly every turn, the simulation industry is searching for a one-box-fits-all solution to save money, time and space. Some companies believe that the video game industry has pointed the way toward "agnostic" systems, said Howard Phelps, a vice president for UAV training and simulation efforts at General Dynamics.

"Training dollars are very scarce for the government and they are trying to get the biggest bang for the buck," Phelps said.

"Soldiers, sailors, airmen, marines – while they need to know how to physically operate their equipment in a real environment, if you can achieve the same training objectives by using a simulation, it saves money." Crashing a live drone could mean a million-dollar loss. An accident on a simulator only costs a bit of time, Phelps explained.

For complete article from the National Defense Magazine, click [here](#).

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*The following article on automobile driving simulators, originally appeared on the University Wisconsin-Madison website.*

## **NEW SIMULATOR PUTS UW-MADISON ON THE MAP FOR DRIVING RESEARCH**

There's only one place in Wisconsin where a driver can send text messages, speed or engage in other risky behaviors with no risk of an accident: the new University of Wisconsin-Madison Driving Simulation Laboratory.

Drivers not only are certain to survive the experience, but the consequences of their actions could be safer vehicles and roads around the country and even around the world.

The driving simulator, located in the Mechanical Engineering Building, addresses a substantial need to test new vehicle technologies and road infrastructure quickly, says its founders, John Lee, the Emerson Electric Quality and Productivity Professor of Industrial and Systems Engineering, and civil and environmental engineering associate professor David Noyce, who also directs the Wisconsin Traffic Operations and Safety Laboratory.

In 1970, no software code was used in vehicles. Now, a vehicle can have millions of lines of code in just its navigation system.

"Vehicles are getting smarter, and we need to get ahead of that rapid change to understand how drivers respond to the technology," says Lee, an expert in driver distraction. "The fundamental reason for the simulator is to understand how people respond to technology so we can design it better and save lives. The car is designed from the ground up to be the car of the future and something we can use to develop and test next-generation vehicle technology and road infrastructure."

Funded by UW-Madison and the Wisconsin Department of Transportation, the simulator includes a Ford Fusion with a 24-foot screen wrapped around in front and an additional



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screen behind the car. Six projectors cast a virtual driving environment on the screens, immersing a driver in as much as 270 degrees of simulation.

The projectors are unique because they render images at the same resolution the human eye does. This allows researchers to, for example, project signage exactly as it would appear to a driver on a physical road. Additionally, the simulator is motion-based and capable of one degree of movement in any direction, which further enhances the realistic experience of driving the simulator.

Flexible software from Realtime Technologies Inc. combined with the high-end hardware will allow researchers to test a wide variety of driver behaviors and responses, many of which aren't economically or ethically possible to test on physical roads. For example, drivers could be dosed with alcohol or learn to navigate a new intersection design.

For complete article from the University Wisconsin-Madison news, click [here](#).

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*The following article on surgical simulation centers advancing medical learning, originally appeared on the Training Simulation Journal (TSJ) website.*

## **CRITICAL CARE**

First-year medical students representing all of the U.S. services filled the National Capital Area Medical Simulation Center (NCAMSC) in Silver Spring, Md., with conversation and laughter as they clustered in conference rooms and hallways. Jamie Roberts, a clinical skills educator, attributed the noise to excitement and nerves as the students waited in anticipation of their first simulated patient interviews.

The students met their patients, played by specially trained actors, in one of 12 exam rooms equipped with live cameras. Instructors

and peers observed the interviews from the control room of the clinical skills lab using computers and headphones. Each of the exam rooms was full, while more students waited eagerly in the wings.

The center supports the Uniformed Services University of the Health Sciences and hosts more than 36,000 hours of simulation exercises each year. By graduation, the average USUHS student will have participated in up to 40 different simulations.

In addition to the clinical skills lab, the center is home to a virtual medical environments lab, a surgical simulation lab and a Wide Area Virtual Environment (WAVE). Since opening in April 2000, the center has expanded from 8,000 to 20,000 square feet and held an audience with nearly every other medical school in the country.

"We are one of the most active medical simulation centers in the nation, if not the world," Roberts said. "And we're looking to expand. But, how do we move past what we are doing now, and for more students?"

NCAMSC houses a wide variety of the medical simulation technologies and carries the dual mission of education as well as research and development.

"Our challenge is to keep asking integration questions," Roberts said. "And also, how to make sure the human element doesn't get lost, and keep the consistency of that with the wow of technology."

The military medical community is preparing to embrace medical simulation technology and keep stride with the civilian medical community, and the training and simulation industry stands ready to accept that challenge.

Col. Francisco Espallat, assistant project manager for medical simulations with the U.S. Army Program Executive Office for Simulation, Training and Instrumentation (PEO STRI), said the Army is looking to take its medical training to



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the next level. "Medical simulation is going to be the next big thing in simulation as a whole," Espaillet said.

PEO STRI offers the Medical Simulation Training Center (MSTC) as a final training component for combat life savers and a recertification tool for combat medics. The MSTC simulates up to eight casualties from a roadside bomb explosion using high-tech, computerized mannequins. Users face other simulated capabilities such as combat noise and smoke, and must analyze the situation, assess the patients and delegate care.

For complete article from TSJ Online, click [here](#).

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*The following article on spy game helping to rehabilitate veterans, originally appeared on the National Defense Magazine website.*

### **SPY GAME TO HELP REHABILITATE VETERANS SUFFERING FROM BRAIN INJURIES**

The signature wound of the Iraq and Afghanistan wars — traumatic brain injury — continues to plague thousands of troops long after they have returned from the battlefield. Many suffer from cognitive impairments including memory loss, reduced attention and concentration and slow central auditory processing speed.

Repairing the damage is possible, neuro-psychologists say. As in physical therapy, cognitive rehabilitation is best accomplished through daily sessions over a long-term period of weeks and months. During that time, clinicians assign exercises to help treat brain injury patients. Many are computer-based drills that include memory games involving playing cards and attention tasks that, for example, require players to hit the space bar whenever the letter "A" appears in a series.

But those cognitive skill exercises do not cut it for combat veterans who grew up playing

Microsoft Xbox and Sony PlayStation video games.

"It's really hard to get them to buy into a video game that doesn't have a cool story line and graphics involved," said Kirk Little, a clinical psychologist who owns a practice in northern Kentucky. Available exercises on the Internet also lack the entertainment factor of console games and become so boring and tedious to use over time that troops eventually lose interest altogether. "It's too much of a chore, like folding your socks," Little said. Without the repeated practice, cognitive functions do not improve, neuroscientists say.

To appeal to the gaming generation, researchers are developing a trainer designed to rehabilitate brain injury patients at Walter Reed Army Medical Center through adaptive scenarios that engage them in audio and visual exercises.

"Our goal was not only to develop a tool that could be used at home, but also to help folks stick with rehabilitation," said Alexandra Geyer, senior cognitive scientist at Aptima Inc., the Woburn, Mass.-based firm that is producing the game.

The training tool, called adaptive gaming for auditory training and evaluation, or AGATE, takes participants through a series of puzzles and exercises with a spy-adventure twist to them.

"They feel like they're playing a video game," said Jason Sidman, a cognitive scientist who leads the instructional and training technologies team at the company.

In the initial phase of AGATE, a player might approach a briefcase with a keypad lock on it. A code is verbally given to him through an earpiece and he has to remember the sequence and punch it in to open the briefcase. "What's under the hood is a digit task that assesses memory — how many digits they can actually



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remember and enter into the keypad," said Sidman.

For complete article from the National Defense Magazine, click [here](#).

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*The following article on simulations unlocking process of biomineralization, originally appeared on the ScienceDaily website.*

### **SIMULATIONS AIM TO UNLOCK NATURE'S PROCESS OF BIOMINERALIZATION**

A University of Akron researcher is leveraging advanced modeling and simulation techniques to more precisely understand how organic materials bond to inorganic materials, a natural phenomenon that if harnessed, could lead to the design of composite materials and devices for such applications as bone replacement, sensing systems, efficient energy generation and treatment of diseases.

Hendrik Heinz, Ph.D., an assistant professor of polymer engineering at UA, is accessing the systems of the Ohio Supercomputer Center (OSC) to study the process of biomineralization, nature's ability to form complex structures, such as bones, teeth and mollusk shells, from peptides.

"Research in our group aims at the understanding of complex interfacial phenomena, particularly biomineralization and organic photovoltaics, at the molecular scale using computer simulation," said Heinz.

"Simulation with atomistic and coarse-grain models and the development of computational tools goes hand in hand with collaborative experimental efforts."

"Advanced materials remains one of the cornerstones of research supported by the Ohio Supercomputer Center and is fundamental to both the economic legacy and future prospects for the State of Ohio," noted Ashok Krishnamurthy. "OSC is committed to providing

state-of-the-art computational and storage resources to scientists, such as Dr. Heinz, who are focused on the design of fascinating new classes and applications of materials."

In a recent paper published by Interface, a journal of The Royal Society, Heinz describes how induced charges modify the interaction of proteins, peptides and bond-enhancing surfactants with metal surfaces. In another recent article, published in the Journal of the American Chemical Society, Heinz explains how he used molecular dynamics simulations to investigate molecular interactions involved in the selective binding of several short peptides to the surfaces of gold, palladium and a palladium-gold bimetal.

"Advances in materials science such as in biomedical and energy conversion devices increasingly rely on computational techniques and modeling," Heinz said. "In particular, interfaces at the nanoscale are difficult to characterize experimentally, such as charge transport mechanisms in solar cells, the formation of biominerals, and self-assembly of polymers in multi-component materials. Model building and simulation are critical to understand dynamic processes across the length and time scales."

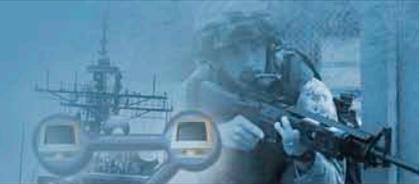
For complete article from ScienceDaily, click [here](#).

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### **DoD MSSOC course enrollment open for 2011.**

The DoD Modeling and Simulation Staff Officer Course (MSSOOC) is scheduled for the following dates/locations in 2011:

25-27	Jan	Alexandria, VA
1-3	Mar	Orlando, FL
5-7	April	Newport News, VA
17-19	May	Wright-Patterson AFB, OH
21-23	June	Fort Sill, OK



This three-day course provides a broad overview of modeling and simulation (M&S) policy and activities of the Department of Defense (DoD), with discussion of how DoD employs M&S in support of training, analysis, acquisition of new products and systems, test and evaluation (T&E) and experimentation. The course focuses on M&S terms, concepts, applications, and information resources, preparing attendees for positions that require conversancy in these topics. Students will gain familiarity with major M&S concepts, policies, organizations, programs, activities, and issues within the Department of Defense. Continuous Learning Units (CEUs) are available for this course.

For more information on upcoming MSSOC Courses, click [here](#).

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### **THE M&S JOURNAL IS CURRENTLY ACCEPTING PAPERS**

The M&S Journal is a theme-based, quarterly publication of technical articles that highlight M&S technology, applications, prototype processes or products, points of view, or emerging philosophies. The M&S Journal is a valuable resource for the M&S community: across DoD, other government agencies, international partner organizations, industry, and academia. The M&S Journal occasionally publishes special issues devoted to a particular topic.

All submitted technical papers for the M&S Journal undergo rigorous peer review following an initial screening for conformance to basic requirements. Publishing in the M&S Journal affords authors both an online and print forum for their M&S technical papers, gaining recognition and publicity throughout the DoD M&S Community. Authors also receive extended visibility for their ideas through free online access to their article on the MSIAC website.

### **Instructions for Authors**

- Submissions may be entirely new work, or previously published papers that would benefit from a wider exposure and would provide valuable resources for M&S users.
- Submission must be previously cleared material for open distribution, and should include reprint permissions.
- Manuscripts should be between five to fifteen pages, or 500 to 5,000 words.
- Manuscripts should be submitted in Microsoft Word format.
- The M&S Journal Editorial Board reserves the right to modify a paper for the purpose of typographical or grammar corrections.
- The author will be notified whether the submission has met the basic requirements for the M&S Journal, and will be notified again when the final acceptance/rejection decision has been made.

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Please contact the [MsiacHelpDesk@dod-msiac.org](mailto:MsiacHelpDesk@dod-msiac.org) for more information, or if you would like to submit a technical paper to the M&S Journal.

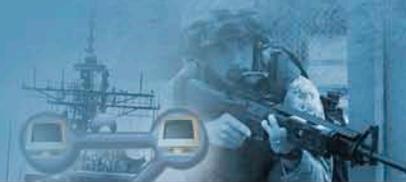
To see the latest issues of the M&S Journal, click [here](#).

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**Please visit the MSIAC [Calendar](#) for a list of events currently taking place in the M&S Community.**

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If you would like to submit an article to be highlighted in the *MSIAC M&S Newsletter*, please forward the article (along with its source data and URL, if available) to the MSIAC Help Desk no later than 15 workdays prior to the publication of the next Newsletter. Potential articles as well as questions or comments on the Newsletter can be emailed to: [MsiacHelpDesk@dod-msiac.org](mailto:MsiacHelpDesk@dod-msiac.org).

The MSIAC also publishes the quarterly *M&S Journal*. If you would like to see the current issue of the *M&S Journal* visit: <http://www.dod-msiac.org>. If you would like to submit an article for the Journal, please email your paper or article to [MsiacHelpDesk@dod-msiac.org](mailto:MsiacHelpDesk@dod-msiac.org) at least 45 days prior to the next publication date.

The *MSIAC Calendar* is available on our website, <http://www.dod-msiac.org>. If you would like to submit a M&S Event for the Calendar, please email the event to [MsiacHelpDesk@dod-msiac.org](mailto:MsiacHelpDesk@dod-msiac.org).

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