



Welcome to the March/April 2011 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 March/April 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

TRAINING IN 3-D

USING VIRTUAL WORLDS TO FIGHT TERRORISTS

GAMMA-RAY SIMULATION

DARPA ANTI-SUBMARINE WARFARE GAME

AIRSPACE SIMULATION

ARMY DATA PORTAL

SIMULATED ACUPUNCTURE

OCEAN WAVES SIMULATION

ENHANCED IMMERSIVE TECHNOLOGIES

DOD MSSOC COURSES FOR 2011

THE M&S JOURNAL
ACCEPTING TECHNICAL PAPERS

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3-D Training Improves Retention

WASHINGTON, April 1, 2011 – The Defense Department has a new use for an existing technology that could replace classroom learning with the reality experience of 3-D video, all with a touch of Hollywood flair.

To maximize what employees remember, DoD officials are using 3-D immersion technology for Pentagon employees' safety training. A 3-D video viewer -- similar to a child's View-Master, which uses a series of 3-D slides inside goggles -- with a noise-reducing headset immerses the viewer in the training while blocking distractions such as ringing phones.

Dave Hodgson, president of 3-D Experiential Training Co., which manufactured the product, said 3-D creates a more memorable experience than two-dimensional media, so the user remembers it longer, noting that a study found that the more senses a person engages in and experiences, the deeper the impact and the longer the memory. His company's system is based on that study, he added.

Increasing memory retention of safety rules and guidelines reduces time lost at work related to work injuries, accidents and property damage, said Brian Higgins of Washington Headquarters Services, who was instrumental in introducing the 3-D program to the Pentagon. Particular safety concerns in the Pentagon are slips, trips and falls, and a lack of safety awareness by employees at work, he said.

The four-video training program is tailored to the Pentagon, and covers emergency readiness and evacuation, safety hazards and basic office safety.





The videos were produced at the Pentagon with the Defense Department to see how accidents might happen at work.

Common Pentagon safety devices are visible in the videos, so people can experience them, Higgins said. Viewers will see the luminescent strips along the Pentagon hallway floors that lead to exits, sliding doors that close off corridors to keep smoke from entering other parts of the building, and delayed-entry doors for security. All were added after Sept. 11, 2001.

Using 3-D technology to teach safety awareness in the Pentagon is an attempt to “attach people personally and emotionally to the consequences” associated with accidents, Hodgson said.

“It was a matter of connecting them so they could add a meaning or value to ... the hazards in their environment,” he added. “Safety is a difficult topic. Generally, it’s boring and mundane information. We’re always looking for new and innovative ways to convey the message, and get people’s attention so they take it seriously.”

The Pentagon system cost \$200,000 for the 12-station hardware and video production, Hodgson said.

The Defense Safety Oversight Council, created to reduce safety mishaps, sponsored the 3-D immersion technology training, and Defense officials say it is fully operational at the Pentagon and at Anniston Army Depot in Alabama.

This article on 3-D training originally appeared on the website of the U.S. Department of Defense. For the original article from the U.S. Department of Defense, click [here](#).



Boardgame

NATO explores the use of virtual worlds to fight terrorists by land and sea.

NATO is taking the fight against smugglers and terrorists to the virtual seas. A new computer game will instruct boarding parties on NATO vessels how to conduct boarding operations and search ships for weapons of mass destruction (WMD).

“Boarders Ahoy!” is the swashbuckling name of a simulation that will be used by the NATO Maritime Interdiction and Operational Training Centre (NMIOTC). This tactical first-person-perspective game is intended to teach boarding parties how to search cargo ships and question crews. The game is sponsored by NATO’s Allied Commander Transformation (ACT).

With NATO vessels engaged in boarding operations in the Mediterranean and off the Horn of Africa, the alliance set up the NMIOTC aboard a decommissioned Greek naval vessel at Souda Bay, Crete. But the ship is swamped by demand.

“Their number of students has exploded in the last three years,” said Wayne Buck, a retired Canadian Army lieutenant colonel who is now a modeling and simulation analyst for NATO ACT. “Three years ago, they had 60 students. [In 2009,] they had 600. In 2010, they’ve had 1,200.”

To participate in training at NMIOTC, all students need to have a minimum threshold of knowledge, including the boarding procedures specified in NATO’s Allied Tactical Publication (ATP) 71.

“We’re finding that some nations, such as the U.S., Canada, Netherlands, Germany, France and the U.K., do these boarding operations as part of their normal exercises,” Buck said. “Some of the other nations, perhaps some of the newer nations to NATO, need a little bit more help.”





Like most serious games, “Boarders Ahoy!” educates by providing an immersive environment. The game is still being fleshed out, but will most likely have three levels: a ship that carries no contraband and whose crew complies with the search; a ship that carries no contraband, but the crew is less than thrilled about being stopped; and a vessel carrying contraband, whose crew is not inclined to spend time in a prison cell.

This article on using virtual worlds, originally appeared in the Training Simulation Journal (TSJ) website. For complete article from TSJ Online, click [here](#).



Breakthrough Study Confirms Cause of Short Gamma-Ray Bursts

WASHINGTON -- A new supercomputer simulation shows the collision of two neutron stars can naturally produce the magnetic structures thought to power the high-speed particle jets associated with short gamma-ray bursts (GRBs). The study provides the most detailed glimpse of the forces driving some of the universe's most energetic explosions.

The state-of-the-art simulation ran for nearly seven weeks on the Damiana computer cluster at the Albert Einstein Institute (AEI) in Potsdam, Germany. It traces events that unfold over 35 milliseconds -- about three times faster than the blink of an eye.

GRBs are among the brightest events known, emitting as much energy in a few seconds as our entire galaxy does in a year. Most of this emission comes in the form of gamma rays, the highest-energy form of light.

"For the first time, we've managed to run the simulation well past the merger and the formation of the black hole," said Chryssa Kouveliotou, a co-

author of the study at NASA's Marshall Space Flight Center in Huntsville, Alabama.

"This is by far the longest simulation of this process, and only on sufficiently long timescales does the magnetic field grow and reorganize itself from a chaotic structure into something resembling a jet."

GRBs longer than two seconds are the most common type and are widely thought to be triggered by the collapse of a massive star into a black hole. As matter falls toward the black hole, some of it forms jets in the opposite direction that move near the speed of light.

These jets bore through the collapsing star along its rotational axis and produce a blast of gamma rays after they emerge. Understanding short GRBs, which fade quickly, proved more elusive. Astronomers had difficulty obtaining precise positions for follow-up studies.

That began to change in 2004, when NASA's Swift satellite began rapidly locating bursts and alerting astronomers where to look.

"For more than two decades, the leading model of short GRBs was the merger of two neutron stars," said co-author Bruno Giacomazzo at the University of Maryland and NASA's Goddard Space Flight Center in Greenbelt, Md. "Only now can we show that the merger of neutron stars actually produces an ultrastrong magnetic field structured like the jets needed for a GRB."

A neutron star is the compressed core left behind when a star weighing less than about 30 times the sun's mass explodes as a supernova. Its matter reaches densities that cannot be reproduced on Earth -- a single spoonful outweighs the Himalayan Mountains.

The simulation began with a pair of magnetized neutron stars orbiting just 11 miles apart. Each star





packed 1.5 times the mass of the sun into a sphere just 17 miles across and generated a magnetic field about a trillion times stronger than the sun's.

This article on study of short gamma-ray bursts, originally appeared on NASA's website. For complete article from NASA, click [here](#).



DARPA's Anti-Submarine Warfare Game Goes Live

Can you best an enemy submarine commander so he can't escape into the ocean depths? If you think you can, you are invited to put yourself into the virtual driver's seat of one of several Anti-Submarine Warfare (ASW) Continuous Trail Unmanned Vessel (ACTUV) configurations and show the world how you can use its capabilities to follow an enemy submarine.

DARPA's ACTUV program is developing a fundamentally new tool for the Navy's ASW toolkit and seeks your help to explore how best to use this tool to track quiet submarines. Before autonomous software is developed for ACTUV's computers, DARPA needs to determine what approaches and methods are most effective. To gather information from a broad spectrum of users, ACTUV has been integrated into the Dangerous Waters™ game. DARPA is offering this new ACTUV Tactics Simulator for free public download.

[\[https://actuv.darpa.mil\]](https://actuv.darpa.mil)

This software has been written to simulate actual evasion techniques used by submarines, challenging each player to track them successfully.

Your tracking vessel is not the only ship at sea, so you'll need to safely navigate among commercial shipping traffic as you attempt to track the submarine, whose driver has some tricks up his sleeve.

You will earn points as you complete mission objectives, and will have the opportunity to see how you rank against the competition on DARPA's leaderboard page.

[\[https://actuv.darpa.mil/LeaderBoard.aspx\]](https://actuv.darpa.mil/LeaderBoard.aspx)

You can also share your experiences and insights from playing the simulator with others.

As you complete each scenario in the simulation, you may submit your tracking tactics to DARPA for analysis. DARPA will select the best tactics and build them into the ACTUV prototype.

This article on an anti-submarine warfare game, originally appeared on the Defense Advanced Research Projects Agency (DARPA) website. For original article from DARPA, click [here](#).



Generic Airspace Phase 5 Simulation

In March 2011, the radar air traffic control (ATC) Laboratory in the Crew-Vehicle Systems Research Facility and the Pilot Simulation Laboratory in Future Flight Central successfully hosted the fifth in a series of human-in-the-loop simulations evaluating the Generic Airspace concept.

The simulation team, including software developers and researchers from Ames SimLabs (Aviation Systems Division) and the Human Systems Integration Division, evaluated the Controller Information Tool (CIT), an auxiliary display used to provide enroute controllers with critical information on traffic flows, sector information, and special use airspace.

The CIT is designed to reduce sector information requirements and allow future air traffic controllers to manage air traffic in Next Generation Air Transportation System (NextGen) airspace with reduced training. In this simulation, a new





integrated, onscreen CIT was compared against the existing separated or off-screen CIT used in prior Generic Airspace simulations.

The effect of mixed aircraft datacomm equipage on the Federal Aviation Administration's (FAA's) Mid-term, High Altitude Airspace Concept was also investigated. In a parallel effort, researchers from the Massachusetts Institute of Technology and the University of Waterloo evaluated controller decision-making in this simulation.

The Multi Aircraft Control System (MACS) software was used to emulate the FAA's en-route air traffic control Display System Replacement (DSR) radar display and user interface. MACS was configured to provide several NextGen automation tools including datacomm, conflict probe, and manual conflict resolution.

Sixteen experienced air-traffic controllers and eight pseudo pilots supported the simulation. The data are currently being analyzed.

This article on airspace simulation, originally appeared on NASA Ames Aviation Systems Division website. For the original article from NASA Ames Aviation Systems Division, click [here](#).



Joint Data Center Army Characteristics & Performance Data Portal

The U.S. Army Materiel Systems Analysis Activity (AMSAA) is the authoritative source for estimates of systems performance used in Army models, simulations, studies, and analyses. AMSAA's Joint Data Center (JDC) serves as the execution entity for the storing, managing and delivering of AMSAA's item level performance data to Army and Joint Modeling and Simulation (M&S) communities in the areas of delivery accuracy, combat identification,

rate of fire, terminal effects, mobility, target acquisition, vulnerability, signature management, active protection, and munitions reliability.

The primary mission of the JDC is to establish, maintain, and improve on the efficient and effective process for requesting, developing and exchanging of systems level characteristics and performance data between AMSAA, internal SMEs, engineering level data providers, and its higher analytical echelon customers. JDC main functions include:

- Serve as the single focal point for system performance data transfer between AMSAA and its internal / external customers
- Ensure that standards are established and followed
- Develop tools to support and automate the data process
- Provide general support to the AMSAA Subject Matter Experts (SMEs) and the customer

Benefits to the customer include:

- Complete data sets
- Single POC for the customer
- Data accountability and traceability standard nomenclatures and formats

JDC and its customers communicate through the use of the Characteristics and Performance (C&P) Data Portal. The C&P Data Portal is under the control of a configuration control board (CCB) in which AMSAA / JDC chairs. The CCB has both a working and senior leadership level influence, which include members from across the Army and Joint analytical M&S community: AMSAA, Office of Secretary of Defense Capability Assessment and Program Evaluation (OSD-CAPE), Headquarters Department of Army (HQDA), Center for Army Analysis (CAA), HQ Training and Doctrine Command (TRADOC), TRADOC Analysis Center (TRAC), US Marine Corps Combat Development Command, Intelligence Community, and Army Research Lab





Survivability and Lethality Analysis Directorate (ARL-SLAD).

JDC maintains the C&P Data Portal for the community on the Secret Internet Protocol Router Network (SIPR), which includes several tools used by the community. To obtain additional information on the Joint Data Center or Characteristics and Performance Data Portal, please contact the Chief of the JDC, Mr. Jin Kwon at 410-278-6599 or jin.kwon@us.army.mil.

This article on the U.S. Army data portal, was contributed by the Chief of the JDC, Mr. Jin Kwon.



‘Simulated’ Needles Just as Effective as Real Acupuncture in Treating Nausea in Cancer Patients, Study Finds

ScienceDaily (Mar. 26, 2011) — Simulated acupuncture -- sometimes referred to as placebo -- is just as beneficial as real acupuncture for treating nausea in cancer patients undergoing radiotherapy, according to a study from Karolinska Institutet and Linköping University in Sweden. Patients, who received only standard care including medications for nausea, felt significant more nausea than patients in both the acupuncture groups.

"The beneficial effects seem not to come from the traditional acupuncture method, but probably from the patients' positive expectations and the extra care that the treatment entails," says Anna Enblom, physiotherapist and researcher at the Osher Centre for Integrative Medicine at Karolinska Institutet. "The patients communicated with the physiotherapists administering the acupuncture,

received tactile stimulation and were given extra time for rest and relaxation."

The study, which is published in the online journal PLoS ONE, included 277 patients at Linköping and Lund university hospitals and Karolinska University Hospital in Solna, all of whom were undergoing radiotherapy of the abdomen or pelvic region for cancer. A selection of 215 patients from this group, were blindly assigned traditional or simulated acupuncture.

The former group (109 patients) had needles inserted into their skin to stimulate certain points, and the latter (106 patients) had blunt telescopic placebo needles merely pressed against the skin. The acupuncture patients were then compared with 62 patients who had only received the standard care regime with medications for nausea and no acupuncture.

This article on simulated acupuncture, originally appeared on the ScienceDaily website. For the complete article from ScienceDaily, click [here](#).



Simulating Breaking Waves

ScienceDaily (Mar. 5, 2011) — The SWAN (Simulating WAVes Nearshore) wave prediction model developed at TU Delft has been a huge international success for many years. This model predicts the distribution of wave heights close to the shore. It was recently expanded to include the SWASH (Simulating WAVes till SHore) model, which enables the modelling of wave behaviour right up to the shore, including how they break and overflow. Over a 1,000 institutes worldwide use the SWAN computer model which is available within the public domain (GNU GPL license, <http://www.swan.tudelft.nl>).

As this model directly simulates the ocean surface, impressive images and film clips can be generated





which are helpful in explaining the complex underlying physics of currents near the shore, and how waves break on the shore. The advent of SWASH means, for instance, that for the first time it is possible to depict how a tsunami flows onto and around an island.

Dr. Marcel Zijlema is the developer and point of contact for SWASH: 'In line with the Flood Defences Act, the Dutch Directorate for Public Works and Water Management needs to ensure that flood defences can withstand the type of storm which only occurs once every 10,000 years. The problem is that we have never experienced this type of storm, and we therefore don't know exactly how high the waves will be or how they will behave. A model like SWASH is excellently suited to giving us a better idea of this type of situation. As we can create a better portrait of the complex processes near the shore, we can better estimate the safe height for our flood defences.'

This article on ocean waves simulation, originally appeared on the ScienceDaily website. For the original article from ScienceDaily, click [here](#).



Virtually There

Avatars and holographs will change how militaries think about immersive technologies.

Without any controllers or wires, simply wave your hand to access your avatar and play video games controlled entirely by your body's movement. Use a neuroheadset to connect wirelessly to a PC and control games and virtual environments using only your mind. Enjoy a 3-D movie then place a video call to your business partner — all from the comfort of your own home.

The everyday consumer has instant access to these technologies, with products like Microsoft Kinect

for Xbox 360, Emotiv's EPOC neuroheadset, flat-screen 3-D TVs and Cisco's umi telepresence. You could outfit your family living room with the latest in immersive, interactive technology for about \$2,500. These developments are occurring in the commercial space at breakneck speed, and the defense industry is sprinting to keep pace.

"I see government letting industry lead us now, when historically the government has been the leader," Tami Griffith, a science and technology manager with the U.S. Army Research Laboratory's Simulation and Technology Training Center (STTC), said. "Now, we're at a place to let industry guide us as they're trying to improve the user's experience in their own living rooms."

Doug Maxwell, also a science and technology manager with STTC, said soldiers are experiencing a gap between the technology they use at home and what they are offered for military training. "Our soldiers are able to go to the store and get very high-def technology to play in," Maxwell said. "But they're not trained to that same level of fidelity. Anything less than what they expect is going to be distracting to them."

Gen. Martin Dempsey, commander of the U.S. Army Training and Doctrine Command, addressed the rapidly changing learning environment at the AUSA Winter Symposium in Fort Lauderdale, Florida, in February. "The next revolution in training our Army must be built around home station," he said.

Dempsey emphasized the need to reframe fundamentals, develop an affordable learning continuum of blended training and place greater demand on the individual for his development.

"We need to provide interesting, relevant and credible training scenarios," he said. Dempsey detailed his vision for a future integrated training environment, to include "intelligent holograms and





avatars for team leader engagement and for interrogations,” and “a virtual collaborative environment in which to conduct after-action reviews.”

As the defense industry sprints to keep pace with emerging commercial technologies, it also juggles the return to home station training, the need for dismounted soldier and irregular warfare training and a strained budget environment. Through these challenges, some of the most cutting-edge interactive, immersive training technologies are emerging, designed to cut costs, bring people closer together and adapt to the next generation of digital natives.

This article on enhanced immersive technologies, originally appeared on the Training Simulation Journal (TSJ) website. For complete article from TSJ Online, click [here](#).



DoD MSSOC Course Enrollment Open for 2011

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

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](#).



The M&S Journal

The Spring 2011 M&S Journal – The Data Issue has been released! Please visit www.dod-msiac.org/journals.html to view The Data Issue.

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.

It is published by the Modeling & Simulation Coordination Office (M&S CO). 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.

Currently Accepting Papers

The M&S Journal is currently accepting paper submissions. All submitted technical papers for the M&S Journal undergo rigorous 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.

Note: The M&S Journal does not accept papers that are structured as commercial advertising, or as promotions of products or services.

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



Modeling & Simulation Calendar of Events

Please visit the [MSIAC Calendar](http://www.dod-msiac.org/calendar.html) for a list of events currently scheduled to take place in the M&S community. The MSIAC Calendar is available on our website, www.dod-msiac.org/calendar.html

Promote an Event

If you would like to promote an M&S event on the MSIAC Calendar, please email the event information to MsiacHelpDesk@dod-msiac.org.



MSIAC M&S Newsletter

The Modeling and Simulation Information Analysis Center (MSIAC) M&S Newsletter is now available as an automatic service. The MSIAC M&S Newsletter is a bi-monthly publication that brings you the most recent information and events from within the M&S community.

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Submit an Article

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.



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