



MSIAC M&S Newsletter

May 2006

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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. Normally, the Newsletter is published on/about the first of each month. Potential articles as well as questions or comments on the Newsletter can be emailed to msiachelpdesk@msiac.dmsi.mil.

The MSIAC also publishes the quarterly *MSIAC Journal On-line*. If you would like to see the current issue of the *MSIAC Journal On-line* visit: <http://www.msiac.dmsi.mil/journal>. If you would like to submit an article for the Journal On-line, please email your paper or article to msiachelpdesk@msiac.dmsi.mil at least 45 days prior to the next publication date.

UPCOMING EVENTS

15-18 May 2006
[15th Conference on Behavior Representation in Modeling & Simulation \(BRIMS\)](#)
Baltimore, MD

16-18 May 2006
[17th International Training and Education Conference \(ITEC\) 2006](#)
London, UK

28-31 May 2006
[20th European Conference on Modeling & Simulation ECMS 2006](#)
Bonn, Germany

29-31 May 2006
[SimTecT Simulation and Training Conference 2006](#)
Melbourne, Australia

6-7 June 2006
[NMSO VV&A Technical Working Group \(TWG24\)](#)
Orlando, FL

12-14 June 2006
[JIDPS/JCATS CCB](#)
Suffolk, VA

13-15 June 2006
[2006 74th MORS Symposium](#)
Colorado Springs, CO

13-15 June 2006
[Modeling and Simulation Staff Officer Course \(MSSOC\)](#)
Redstone Arsenal, AL

19-22 June 2006
[2006 Euro SIW](#)
Stockholm, Sweden

20-22 June 2006
[2006 Command and Control Research and Technology \(CCRTS\) Symposium](#)
San Diego, CA

Flash!!! Flash!!! The DoD Acquisition Modeling and Simulation Master Plan has just been signed out by Mr. Mark Schaeffer, Acting Director, Defense Systems, OUSD(AT&L). You can download a copy at:
http://www.acq.osd.mil/ds/se/publications/AMSMMP_041706_%20FINAL2.pdf

DoD ANNOUNCES WINNERS OF ANNUAL MODELING AND SIMULATION AWARDS

The Department of Defense announced today that five winners have been selected for the eighth annual Department of Defense Modeling and Simulation (M&S) Awards. The winners for each category are:

Acquisition: Joint Attack Munitions Systems (JAMS) Project Office, U.S. Army Program Executive Office for Missiles and Space. Team award for developing an innovative approach for simulation based acquisition. The team's synergistic process of taking advantage of tri-service government technical expertise, developed over years of experience on legacy, as well as ongoing programs in an integrated product team environment to develop an integrated flight simulation and accompanying tool set, will reduce risk, lead to a better product in a shorter period of time and at a lower cost to the taxpayer.

Analysis: Weapon Effects Analysis and Probability System (WEAPS) Team, Air Force Materiel Command. Team award for developing and maintaining a world-class software simulation tool that is highly valued by the warfighter and supports combatant command requests for campaign, theater, and engagement analyses of air-to-surface munitions effectiveness. WEAPS makes a critical contribution to theater-level models such as the Combat Forces Assessment Model and is a key tool in the annual Non-Nuclear Consumables Annual Analysis process.

Test and Evaluation: U.S. Air Force Maj. Kelly A. Greene, Ph.D., Air Force Agency for Modeling and Simulation. Individual award for significant contributions to advancing M&S in support of test and evaluation (T&E). Greene innovated and transformed T&E at both the Air Force and joint levels, altering the use of live, virtual, and constructive distributed M&S environments in support of T&E. Greene is directly responsible for the largest progression of distributed T&E ever recorded in a single year.

Training: U.S. Army Maj. Daniel P. Ray, Office of the Army Deputy Chief of Staff, G-

2. Individual award for developing the "Every Soldier is a Sensor Simulation" to increase a soldier's situational awareness on the battlefield. He took the concept from infancy to a low-cost working prototype in 90 days. Following the success of the prototype, he spearheaded further development, delivering a product that is being used to train thousands of soldiers that are daily having a direct impact on the Global War on Terrorism.

Cross-Function: Training Improvised Explosive Device (TIED) Team, Army Program Executive Office for Simulation, Training, and Instrumentation. Team award for providing a safe and realistic training system to replicate the IEDs employed against coalition forces by insurgents in Iraq. The TIED Team, jointly with the U.S. Joint Forces Command, rapidly developed, coordinated, contracted, developed and fielded this critical capability to the warfighter.

The annual awards recognize achievement in support of DoD M&S objectives. Seventy-nine nominations were received from across DoD.

The awards were presented to winners May 2 at the DoD Modeling and Simulation Conference in Baltimore, Md. For original article visit:

<http://www.defenselink.mil/releases/2006/nr20060411-12797.html>

SIMLABS AIR TRAFFIC CONTROL LAB GETS AN UPGRADE

SimLabs Crew Vehicle System Research Facility's (CVSRF) Radar Air Traffic Control (ATC) Lab is being upgraded. The upgraded radar ATC lab will provide a flexible research environment making it better suited to accommodate research activities now being developed by NASA and the FAA. Research related to advanced air traffic management automation tools, simulation of new airspace operations, procedural changes, and noise studies may be conducted with higher fidelity than ever.

The FAA provided controller displays and consoles to the radar ATC lab without cost. The 28-inch displays are the most widely used controller displays in FAA terminal and en route air traffic control facilities. The displays and associated new display consoles will replace 17- and 18-inch computer monitors that have previously been used as controller radar displays. The addition of actual FAA displays and consoles will greatly improve the fidelity of the radar lab.

Currently, the most appropriate configuration for the lab is being considered. These displays may be used as six terminal (Terminal Radar Approach Control (TRACON)) positions, three en route (Air Route Traffic Control Center (ARTCC)) positions or a combination of the two types of positions. Six additional displays are available for future use and can provide capability to enlarge the en route and approach control areas simultaneously.

The CVSRF ATC Lab is a unique radar lab within NASA and the FAA because it has the ability to be connected with all the facilities within SimLabs (the B-747-400 Simulator, Advanced Concept Flight Simulators and the FutureFlight Central control tower simulator). This connectivity provides researchers with gate-to-gate flight simulation capabilities. Discussions are being held with FAA training personnel to see if the lab could be used to help expedite or enhance post-academy controller training. For original article visit: http://www.simlabs.arc.nasa.gov/newsletter/news.html#vast_atm

SIMULATION BRINGS REALISM TO VIRTUAL COMBAT

FORT BRAGG, N.C. (Army News Service, April 21, 2006) – Soldiers have a time-honored way of figuring out what happened after a firefight. They sit down together and hash it out, endlessly going over every moment of the battle as they try to determine who shot first, who hit their target, who missed, etc.

Because of the limits of memory and perspective, some of those questions could never be answered. Today, however, a high-

tech device called the Engagement Skills Trainer is giving Soldiers new insights into the anatomy of a firefight.

The EST is an interactive combat simulator. Using the EST, Soldiers encounter virtual combat engagements and receive instant feedback from the computer on every shot fired, without the costs or safety risks of firing real ammunition, said Michael Graziano, EST facility instructor.

“It tells you everything. The computer calculates time, space and distance to the second. On every shot fired, there’s feedback. And all it costs is electricity,” Graziano said.

One of only six EST facilities in the Army, Fort Bragg’s EST has been open for five years, said Graziano. Each setup can accommodate up to 10 Soldiers, who employ computer-connected weapons.

As real-life combat scenarios play a screen before them, the Soldiers’ reactions are collected and analyzed by the computer for review. Depending on what the Soldiers do or don’t do, the computer adjusts the scenario.

What separates the EST from first-person shooter video games is its realism, said Graziano. Every weapon used in the EST is a real weapon that has been modified, rather than a replica. The action, recoil and feel of the weapons are no different than they would be on the range, he said.

Soldiers using the EST are not limited to firing only M-4s or M-16s. The facility has versions of virtually every weapon system used by the Army, Graziano said. “If they’ve got it in the arms room, we’ve got it here,” he said.

Each “round” that the weapons fire at the screen is actually a laser beam that is tracked and analyzed by the EST computer. If the round hits one of the enemy fighters on the screen, the computer adjusts the scenario to show that he has been wounded or killed.

Paratroopers from 1st Battalion, 325th Airborne Infantry Regiment, 82nd Airborne

Division, trained on the EST April 19.

Inside one of the dark rooms, Sgt. 1st Class Donel Hagelin monitored the computer while five Paratroopers got into position on the firing lanes. Hagelin commanded them to lock and load.

On screen, a white van came to a halt at the end of a sandy, desert road. Two unarmed men dismounted and began yelling in Arabic. Then, from the back of the van, two additional men ran out with AK-47s. Instantly, the Paratroopers unleashed a hail of simulated bullets at the screen. In seconds, it was all over.

During the replay, it became clear that one of the Paratroopers had shot at the unarmed men running away. Hagelin corrected him on the spot.

“Situational awareness, men – I can’t stress that enough. That’s something you’re going to have to live with if you kill someone who is just caught in the crossfire,” he said.

After running through several more scenarios, Hagelin was enthusiastic about the value of the EST. The simulator allowed him to give precise feedback to his Paratroopers, and gave them a chance to work on their techniques without having to waste rounds at the range, he said.

“It’s the fastest way to train troops and the easiest way to save money,” he said. For original article visit:
http://www4.army.mil/ocpa/print.php?story_id_key=8883

***M&S CAUCUS CHAIRMAN
CONGRESSMAN RANDY FORBES
URGES PRESIDENT TO SUPPORT
MODELING AND SIMULATION***

Last month, Congressman Randy Forbes met with President Bush to discuss the important role that Modeling and Simulation can have in addressing national challenges such as military preparedness and operations, homeland security, disaster preparedness and relief, energy management and education. To further this discussion, Forbes recently sent a letter to the President to encourage his support and

utilization of the many advancements available to the Administration through application of Modeling & Simulation.

In a letter addressed to the President, Forbes states: “Modeling and Simulation is the single most powerful tool available to support our nation’s international competitiveness in a wide variety of economic sectors. It is clear that an effective and diverse national industrial infrastructure already exists to advance this industry . . . The Modeling and Simulation Caucus offers you and your administration a distinctive and imaginative opportunity to highlight your commitment to America’s international economic competitiveness.”

A copy of the letter is available at:
<http://www.house.gov/forbes/documents/letterpotusaboutm%20and%20s.pdf>

***INTERACTIVE TECHNOLOGIES HOLD
KEY TO EXPERIMENT’S SUCCESS***

In the world of massively multiplayer online role-playing games, it is common for thousands—even tens of thousands—of players to participate.

By that measure, the Joint Forces Command’s recent three-week exercise, Multinational Experiment 4, or MNE4 for short, was small potatoes; it had about 800 participants.

On the other hand, MNE4’s participants were Australia, Canada, Finland, France, Germany, Sweden, the United Kingdom and the United States, plus NATO. In all, 29 countries were represented, making it the largest experiment to date in which countries use their collaborative power to influence adversaries’ behavior.

The simulation at the heart of MNE4 was a “stability scenario set in the country of Afghanistan, but nothing having to do with planning for the future,” said Marine Col. Gareth Brandl, who works for JFCOM in its multinational/interagency experimentation operation and was one of the role-players in MNE4.

“Stability operations are what everybody’s

looking at these days, with the increasing levels of conflict” around the globe, Brandl said. The scenario included aspects of combat operations, but it also included some humanitarian efforts in the region being supported by the military.

To pull together the technology and tools needed at 17 locations in several countries, technical teams from the participating nations spent almost two years assessing products and planning for their integration into the exercise.

Air Force Maj. Pete Carrabba, of JFCOM’s experimentation engineering department, led the behind-the-scenes team that selected the tools and provided round-the-clock support once the experiment got underway.

“I was in charge of the U.S. tech team, over 140 people,” Carrabba said. “I filled the leadership role for the tech leads for all other nations.”

As the name indicates, MNE4 was the fourth multinational exercise to test methods of collaboration. Each exercise takes two years to organize; planning is already taking shape for MNE5, in 2008. Each experiment builds upon the results of the previous one.

This year’s exercise was to explore “effects-based operations” at the multinational level—that is, the uses of multiple forms of power by nations coordinating their actions. The acronym “DIME” sums up the power dimensions: diplomatic, information, military and economic. So MNE4 was using an alternative reality to test how to integrate national policies across borders to control “bad actors” without using force as a first resort.

The tech teams from all the countries first had to agree on the tools to be used.

Early on, Carrabba and his fellow team leads designed a technical architecture to support the experiment. Based on the architecture, JFCOM put out a request to industry for information.

“We’re having an experiment, and here’s our problem set,” Carrabba said, summing up

the RFI. “You can nominate tools. A tool has to be releasable to all the countries, interoperable, provided at no cost to us and Web-enabled,” to name a few of the criteria.

The JFCOM team received 75 nominations. A technical team whittled the list down to 40, and those companies were invited in to give a two-hour hands-on demonstration and explain how their tools would support the experiment. For complete article visit: http://www.gcn.com/print/25_9/40440-1.html

SYSTEMS ENGINEERING AND TEST: AN IMPROVED PARTNERSHIP ENABLED BY M&S

After more than a decade of acquisition reform, with diminished government involvement in systems engineering, there has been a realization that a disciplined systems engineering approach must be re-emphasized as a critical component of effective systems acquisition. The Acting Under Secretary of Defense for Acquisition, Technology and Logistics issued a policy memorandum in February 2004 that directed a revitalization of systems engineering (SE) in the development and testing process. He further directed the establishment of a senior-level Department of Defense (DoD) Systems Engineering Forum to oversee its implementation. This was the first of a series of acquisition policies and guidance to address planning and management for SE revitalization. The SE Forum includes participation by the military departments and defense agencies to leverage their activities and provide a collaborative means to foster SE discipline across DoD.

Modeling and simulation imperative:
As the DoD components have sought to reduce the cost, time and risks associated with systems acquisition, there has been a persistent and pervasive interest in applying modeling and simulation (M&S) to help throughout the acquisition process, from capability trades, to design, manufacturing, test, operations and sustainment. DoD’s 2003 commitment to acquire functional capabilities, not just individual systems, has greatly increased the number of variables and interactions that must be considered in any acquisition. The resulting complexity, adverse pressure on schedules and risk, as

well as practical limitations on DoD's ability to test functional capabilities in a realistic environment have all contributed to an intense interest in how M&S can help. As a byproduct of this interest, the department also recognized that M&S use in acquisition is far from optimal, with many obstacles precluding its efficient and effective use.

Acquisition M&S Working Group:
These factors led the SE Forum to establish an Acquisition M&S Working Group (AMSWG) to consider the matter of M&S support to acquisition and to make recommendations to the forum. The AMSWG membership mirrors that of the SE Forum and is composed of people with some mix of expertise in both acquisition and M&S. A GS-15 official from the OUSD (AT&L) DS/SE organization, chairs the AMSWG. AMSWG members individually report to their component's SE Forum principal, thus helping ensure the AMSWG focuses on M&S support to the systems acquisition process, and not simply on M&S as an end in itself. The AMSWG also has enlisted the help of other organizations not otherwise represented on the SE Forum, such as the Defense Modeling and Simulation Office (DMSO) and Defense Intelligence Agency.

For complete paper from ITEA Journal • December 2005/January 2006 visit:
<http://www.itea.org/>

NASA ACHIEVES BREAKTHROUGH IN BLACK HOLE SIMULATION

NASA scientists have reached a breakthrough in computer modeling that allows them to simulate what gravitational waves from merging black holes look like. The three-dimensional simulations, the largest astrophysical calculations ever performed on a NASA supercomputer, provide the foundation to explore the universe in an entirely new way.

According to Einstein's math, when two massive black holes merge, all of space jiggles like a bowl of Jell-O as gravitational waves race out from the collision at light speed.

Previous simulations had been plagued by computer crashes. The necessary equations, based on Einstein's theory of general relativity, were far too complex. But scientists at NASA's Goddard Space Flight Center in Greenbelt, Md., have found a method to translate Einstein's math in a way that computers can understand. "These mergers are by far the most powerful events occurring in the universe, with each one generating more energy than all of the stars in the universe combined. Now we have realistic simulations to guide gravitational wave detectors coming online," said Joan Centrella, head of the Gravitational Astrophysics Laboratory at Goddard.

The simulations were performed on the Columbia supercomputer at NASA's Ames Research Center near Mountain View, Calif. This work appears in the March 26 issue of Physical Review Letters and will appear in an upcoming issue of Physical Review D. The lead author is John Baker of Goddard.

Similar to ripples on a pond, gravitational waves are ripples in space and time, a four-dimensional concept that Einstein called spacetime. They haven't yet been directly detected.

Gravitational waves hardly interact with matter and thus can penetrate the dust and gas that blocks our view of black holes and other objects. They offer a new window to explore the universe and provide a precise test for Einstein's theory of general relativity. The National Science Foundation's ground-based Laser Interferometer Gravitational-Wave Observatory and the proposed Laser Interferometer Space Antenna, a joint NASA - European Space Agency project, hope to detect these subtle waves, which would alter the shape of a human from head to toe by far less than the width of an atom.

Black hole mergers produce copious gravitational waves, sometimes for years, as the black holes approach each other and collide. Black holes are regions where gravity is so extreme that nothing, not even light, can escape their pull. They alter spacetime. Therein lies the difficulty in creating black hole models: space and time shift, density becomes infinite and time can come to a standstill. Such variables cause

computer simulations to crash. For complete article visit:
<http://www.nasa.gov/vision/universe/starsgal/axies/gwave.html>

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