MSIAC M&S Newsletter

July/August, 2009 

*Welcome to the July/August 2009 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 July/August 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 provide valuable insight into the applications of M&S technologies throughout the community.*

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***M&S Staff Officer Course***

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*The following article on enhancements in Marine Corps Joint Readiness, originally appeared on the United States Joint Forces Command (USJFCOM) website.*

***USJFCOM JOINT FIRES UNIT ENHANCES JOINT READINESS FOR MARINES***

TWENTYNINE PALMS, Calif. - Aug. 24, 2009 - The Marine Corps Tactics and Operations Group (MCTOG) and U.S. Joint Forces Command's (USJFCOM) Joint Fires Integration and Interoperability Team (JFIIT) partnered here to improve the joint training and combat readiness of Marine battalion and regimental staffs before they deploy to Afghanistan and Iraq.

The recently completed Spartan Resolve exercise included academic instruction, a command post exercise, and a live fire event.

The exercise focused on integrating joint, coalition, and interagency partners in a live, virtual, and constructive environment replicating conditions commanders and staffs will experience once deployed, according to leaders at MCTOG.

"The only way you can replicate the environment that you find in Afghanistan and Iraq is to make it joint and interagency," said Marine Corps Col. William F. Mullen III, commander, MCTOG. "We want our units going through the training here to have a déjà vu-like experience when they get into theater - we don't want them to have any surprises."

An important part of training equips Marine Corps commanders and staffs with knowledge they need to use the joint combat multipliers at their disposal when deployed according to MCTOG leaders.

"Our goal is to teach Marines how to plan, integrate, and employ joint fires and intelligence, surveillance, and reconnaissance (ISR) assets in a realistic operational environment similar to what they will experience once in theater," said Marine Corps Lt. Col. Rob Buzby, executive officer, MCTOG. "It's a joint fight, and organizations like JFIIT help our Marines learn how to employ joint capabilities that will improve our effectiveness against today's asymmetric threat."

JFIIT assisted MCTOG as they trained battalion and regimental staffs by providing joint fires and ISR subject matter experts to coach, teach and mentor during Spartan Resolve.

"MCTOG does an excellent job of integrating joint assets to replicate a near-real-world environment," said Army Maj. John Bowman, JFIIT lead at MCTOG. "Our mission is to help integrate the joint enablers of the targeting process that teach and reinforce tactics, techniques, and procedures (TTP) that will shorten their learning curve once in country." For complete article from USJFCOM, click here.

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*The following article on online virtual worlds supporting troops, originally appeared on the DefenseLink News website.*

***SCIENTISTS USE VIRTUAL WORLD TO SUPPORT TROOPS***

WASHINGTON, Aug. 3, 2009 - Scientists are using virtual online worlds to improve the flow of information and support to service members returning from deployments.

Jacquelyn Morie of the University of Southern California's Institute for Creative Technologies discussed the "Transitional Online Post-deployment Soldier Support in Virtual Worlds" project during a July 29 webcast of "Armed with Science: Research and Applications for the Modern Military" on Pentagon Web radio.

Also known as "Coming Home," the project will create a space within Second Life -- a 3-D online virtual community -- dedicated to providing camaraderie, support and resources for returning soldiers trying to reintegrate into civilian life.

"Second Life is unique because it allows users to build things and own the things they build," Morie said. "It has a huge range; whatever people can imagine and dream, they can build there. You're represented by a 3-D avatar, so you can represent yourself however you feel is appropriate for who you are."

The project incorporates immersive games, virtual world expertise and virtual human intelligence. Coming Home will be populated with artificial, intelligence-driven virtual characters that can aid veterans in finding support and therapies.

"You can think of it as the VFW hall of the 21st century," Morie explained. "Most veterans, when they come back, are not collocated into neighborhoods the way people were in World War II. So this gives people a chance to be together, even if they're widely dispersed."

Morie's research team also is developing an online veterans center that focuses on social activities and complementary and alternative medical interventions that can help prevent stress and post-traumatic stress disorder.

"We're working with the Mindfulness Center in San Diego, and they'll be running classes in Second Life in our land with veterans," Morie said. "We'll see how the veterans respond to that and how the facilitators work."

Morie said that the center also will create artificial, intelligence-based avatars that will populate Second Life's veterans' center. For complete article from DefenseLink News, click here.

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*The following article on the Navy's synthetic training, originally appeared on the Virginian-Pilot/PilotOnline.*

***NAVY'S SYNTHETIC TRAINING ALLOWS IT TO STAY READY***

As you read this, more than a dozen Navy ships and thousands of uniformed service members, military civilians and contractors are embarked on a major training exercise in the Persian Gulf.

But thanks to synthetic training, no one has to leave their homeport.

The two-week operation, named "Bold Spectrum," began July 13 and involves

about 10,000 people and 21 ships stationed around the country, including a German ship.

The recent surge in demand for Navy services has forced the Navy to trim costs wherever possible. Earlier this year, U.S. Fleet Forces announced a scaling back of funding for planes and ships not currently on deployment.

Computer simulations have proved able to fill the gap. The technology began as an experiment about a decade ago and the Navy soon realized it could be used for training. Large-scale exercises began about five years ago, and they've grown more complex as computers and connectivity have improved.

In a synthetic exercise, controllers send real-time data to the ships' displays, communications systems and combat systems, creating scenarios that put them in a certain geographical position and then introduce all manner of threats, be they enemy planes, ships or submarines.

The Navy currently uses synthetic along with live exercises for strike groups and individual ships preparing to deploy.

The aircraft carrier Dwight D. Eisenhower, for example, used similar training to qualify for major combat operations earlier this year.

Normally, the ship would have taken part in an underway joint task force exercise, or JTFEX, costing about $25 million. The synthetic price tag was about one-tenth of that.

The current exercise goes all the way up to the fleet level, giving fleet and strike group staffs the chance to participate.

All assets are participating in some form in the main exercise, which involves three different strike groups in a mock Persian Gulf scenario. In addition, some of the ships are doing unit-level work, including force protection and damage-control drills. For complete article from the Virginian-Pilot/PilotOnline, click here. Copyright (c) 2009, The Virginian-Pilot/PilotOnline.com. Reprinted with permission.

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*The following article on SIMUG Live simulation platform, originally appeared on the Army-Technology website.*

***KEY HANDED OVER FOR SIMUG LIVE SIMULATION PLATFORM IN SWITZERLAND***

On 3 July at the Bure training ground (Switzerland), RUAG Electronics handed over the system key for the SIMUG live simulation platform to armasuisse, the Swiss Armed Forces' centre of excellence for procurement. The Swiss Army has thus now received the first of three state-of-the-art combat training centres.

SIMUG, which is a simulation support platform for field training exercises, enables battlefield environments to be trained for in line with today's needs. Training is highly realistic and takes place using laser-based simulators. All weapons can be employed, including direct-hit, high angle and area weapons. Fire and its effects in the battlefield are simulated in a lifelike manner using charge boxes specially developed for the purpose.

All exercise participants such as vehicles and infantrymen are kitted out with laser firing simulators. This enables combined arms training that reflects the relative forces of the weapons involved. All participants are connected by transponders and W-LAN to the control centre.

The position and status of all involved, plus the battlefield events that occur, are recorded in real time and are then available in a multimedia format for debriefing after the exercise. Training can be carried out up to reinforced company level.

The Swiss Army has been training for years with laser firing simulators. These simulators can now be united under SIMUG and put to combined use. On 3 July at a celebratory

ceremony, CEO of RUAG Electronics Andreas Herren handed over the symbolic system key to chief of armaments Jakob Baumann and the Swiss Army.

"For effective, good training, soldiers must be able to immediately perceive the consequences of their actions and the reaction of their adversary," said Mr. Herren. "Thanks to SIMUG, this wish has been made a reality, and I am delighted that we can enable our customers to carry out their operations successfully."

After several years of development work, SIMUG was approved by the Swiss Federal Council and authorised by Swiss Parliament under the Armament Programme 2004. The procurement scope of 95 million Swiss francs for SIMUG comprises the facilities at Bure and St Luzisteig.

Operation of SIMUG will be privatised by way of a pilot test, with RUAG Electronics taking on operational responsibility. The pilot project will run until 2015. For original article from Army-Technology, click here.

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*The following article on the Air Force Research Laboratory (AFRL) holding a wargame at Maxwell AFB, originally appeared on the AFRL's website.*

***AIR FORCE RESEARCH LAB HOLDS WARGAME AT MAXWELL***

MAXWELL AIR FORCE BASE, Ala. -- Exploring the potential military utility of future Air Force technologies is the key objective of a wargame held Aug. 10-14 by the Air Force Research Laboratory at Maxwell's Air Force Wargaming Institute, said the chief of AFRL's Strategic Planning Branch.

"This is a virtual exercise of potential war-fighting capabilities/system concepts," Dr. Tamara Chelette said. "It is a unique wargame that allows for a good deal more creativity, and that is something we don't get to do in other wargames we are involved in."

Scott Ley, team lead for AFRL Focused Long-Term Challenge Plans and Programs, said the wargame is joint in nature, as members from many services and organizations are participating.

"We have representatives from most of the Air Force major commands; the Army, Navy and Marine Corps; and some geographic commands, and they are serving as operators of these potential new system concepts AFRL has created," he said. "We also have AFRL scientists here to serve as subject matter experts on the proposed use of the new technologies, and to learn from the operators on how to use the new systems."

Mr. Ley said the Air Force has AFRL working on "40 approved problems," and research lab personnel are applying technology to build potential warfighting capabilities to solve those problems.

"We're creating capabilities for future warfighting, and are here to explore the value of these capabilities with the users [operators]," he said.

Matt Caffrey, AFRL lead for wargaming, said he felt, as of Wednesday, the game was "going well," and one explanation might be the high level of diversity in this wargame.

"We have every service represented, and one of the reasons for being comprehensive is that we need to anticipate the capabilities of warfighting concepts," he said. "We need to have all types of warfighters because a capability designed for one service might well be useful to another service for something other than the originally intended purpose. It is easy to say joint, but much harder to truly identify opportunities for joint advantage."

Mr. Caffrey said what "breathes life" into a

wargame is the players, and he is "very impressed" with players in this game because they are adding as much value to the wargame as they can. He said three goals of the wargame are: to gain insight into potential military utility; support the Air Force Futures Game; and to learn as much as possible from this exercise to make next year's game better.

Dr. Chelette said the wargame also offers a chance to "fine-tune" the concepts of operation of the warfighting concepts being played in the game. She said AFRL devotes a lot of time and effort to its new technologies before they come to the game. Another possible advantage of the wargame is that operators may find better ways to do things that are presented during the game. Dr. Chelette said AFRL members who have come to this year's event have a challenge to make the systems better. For complete article from the Air Force Research Laboratory, click here.

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*The following article on training to assemble the James Webb telescope, originally appeared on NASA's website.*

***KEEPING A "TRAINED EYE" ON THE JAMES WEBB SPACE TELESCOPE***

NASA and Northrop Grumman are keeping a "trained eye" on the James Webb Space Telescope, by training their engineers on how to handle and assemble the telescope's Optical Telescope Element (OTE), also known as the "eye" of the telescope.

Recently, a mock-up of the OTE's Primary Mirror Backplane Assembly (PMBA), which supports the telescope's mirror segments, was used to simulate how the element frame will be handled when the actual components of the telescope are being assembled.

The OTE's support frame will actually house all 18 of the Primary Mirror Segment Assemblies that comprise the Primary Mirror on the telescope. The OTE gathers the light coming from space and directs it into the science instruments.

The James Webb Space Telescope is the next-generation premier space observatory, exploring deep space phenomena from distant galaxies to nearby planets and stars. The Webb Telescope will give scientists clues about the formation of the universe and the evolution of our own solar system, from the first light after the Big Bang to the formation of star systems capable of supporting life on planets like Earth.

The Webb telescope needs a large mirror (made up of the 18 mirrors) to collect as much light as possible to see galaxies from the beginning of the Universe. The Webb telescope scientists and engineers have determined that a primary mirror 6.5 meters (21.3 feet) across is needed to collect enough light to measure these galaxies.

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*The following article on the simulation of stars, originally appeared on the Stanford SLAC Accelerator Laboratory's website.*

***SIMULATION ILLUMINATES UNIVERSE'S FIRST TWIN STARS***

Menlo Park, Calif.—The earliest stars in the universe formed not only as individuals, but sometimes also as twins, according to a paper published today in Science Express. By creating robust simulations of the early universe, astrophysicists Matthew Turk and Tom Abel of the Kavli Institute for Particle Astrophysics and Cosmology, located at the Department of Energy's SLAC National Accelerator Laboratory, and Brian O'Shea of Michigan State University have gained the most detailed understanding to date of the formation of the first stars.

"We used to think that these stars formed by themselves, but now we see from our computer simulations that sometimes they have siblings," said Turk. "These stars provide the seeds of next generation star formation, so by understanding them we can better understand how other stars and galaxies formed."

To make this discovery, the researchers created an extremely detailed computer simulation of early star formation. Into this virtual universe they sprinkled primordial gas and dark matter as it existed soon after the Big Bang, data they obtained from observations of the cosmic microwave background. This mostly uniform radiation—a faint glow of radio waves spread across the entire sky—contains subtle variations that reflect the beginning of all structure in the universe.

Turk, Abel and O'Shea ran five data-intensive simulations, each of which covered a 400 quadrillion cubic mile volume of the universe and took about three weeks to run on 64 processors. The simulations focused on the first Population III stars: massive, hot stars thought to have formed a mere several hundred million years after the Big Bang.

As the researchers watched their simulated universe evolve, waves of gas and dark matter swirled through the hot, dense universe. As the universe cooled, gravity began to draw the matter together into clumps. In areas rich with matter, stars began to form. And, in one out of the researchers' five simulations, a single cloud of dust and dark matter formed into "twin" stars: one with a mass equivalent to about 10 suns, and one with a mass equivalent to about 6.3 suns. Both of them were still growing at the end of the calculation and will likely grow to many times that mass.

"We ran five of these calculations starting from the beginning of the universe, and to our surprise one of them was special," said Abel. "This opens a whole new realm of research possibilities. These stars could evolve into two black holes, which could have created gravitational waves we could detect with an instrument like the Laser Interferometer Gravitational Wave Observatory and, if they fall into bigger black holes, for the Laser Interferometer Space Antenna. Or one of the stars could evolve into a black hole that could create gamma-ray bursts that we could detect with the Swift mission and the Fermi Gamma-ray Space Telescope." For complete article from SLAC Accelerator Laboratory, click here.

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*The following article on the National Engineers Week's Competition, was contributed by Future City Hampton Roads.*

***CREATING GREEN LIVING SPACES TO HOUSE THE NEEDIEST***

*NATIONAL ENGINEERS WEEK FOUNDATION'S 2009-10 FUTURE CITY® COMPETITION CHALLENGE FOR AMERICA'S MIDDLE SCHOOLERS*

Designing affordable housing for those most in need is enormously complicated. But how to do it while adhering to LEED recognized green

building standards, with an emphasis on energy efficiency and a low carbon footprint?

That's the challenge for America's middle schoolers as they prepare for National Engineers Week Foundation's 2009-10 Future City® Competition. Now entering its 18th year, Future City Competition invites seventh and eighth graders nationwide to create the cities of tomorrow and encourages interest in science, technology, engineering and math through hands-on applications.

"Future City motivates students to learn more about the possibilities and opportunities for careers in engineering," said Leslie Collins, Executive Director, National Engineers Week Foundation. "As they participate in the competition, they realize that engineering is exciting and creative and that they can use what they know to make a difference in the world. Helping young people discover what the field has to offer is a critical step in insuring that the engineering profession continues to grow in the years ahead."

Themed "Providing An Affordable Living Space For People Who Have Lost Their Home Due to a Disaster or Financial Emergency", this year's Future City Competition will attract more than 33,000 students from 1,100 middle schools in regions located across the country. Participating students will be asked to design a model of their city using SimCity 4 Deluxe software, provided by Electronic Arts, and then build a physical model of the city using recycled materials. They will also write a research essay describing their design and a second narrative outlining the key features of their city.

The regional competition gets underway with the new school year in September and culminates with the regional finals in January. One winning team from each region qualifies for a trip to the national finals in Washington DC, which take place during Engineer's Week, February 15-17, 2010. The National Finals Grand Prize winners receive a trip to U.S. Space Camp in Huntsville, Alabama, provided by National Finals host Bentley Systems, Incorporated. The second and third prize winners receive $5,000 and $2,000 scholarships for their schools' technology programs.

"We learned that engineering is more than just making sure that buildings work the way they are supposed to," commented Tom Krajnak, 14, a member of the 2009 Grand Prize winning team from Bexley Middle School in Bexley, Ohio.

"Engineers are involved in every aspect of building a city. We discovered how necessary they are and now we know the reasons why." Registration deadline for schools nationwide is October 31, 2009 but, to help students get an early start before the close of the current school year, Future City is offering early registration to interested students. Future City is also looking for professional engineers who may be interested in serving as mentors. For information, school registration, or to volunteer in the Future City Competition, visit www.futurecity.org, www.futurecityhamptonroads.org.

For questions about this Competition, contact the Hampton Roads Regional Coordinator at futurecityhamptonroads@cox.net.

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***DoD MODELING & SIMULATION STAFF OFFICER COURSE***

*October 6-9, 2009*
*Alexandria, VA*

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 this course, click here.

***Please visit the MSIAC Calendar for a list of events taking place in the M&S Community.***

***MSIAC M&S NEWSLETTER***

*The MSIAC M&S Newsletter is compiled from a variety of news sources, periodicals, and reports, and is provided as a service by the MSIAC solely for informational purposes. For comments and questions please email: msiachelpdesk@dod-msiac.org.*

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