MSIAC M&S Newsletter

Welcome to the September/October 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 September/October 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

MSIAC exhibits at I/ITSEC with the M&S CO

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Defense M&S Group added to 2010 DAS

US Government invites public to solve challenges through new website

DHS holds largest simulated cyber attack

Submarine crews learn mariner skills with virtual simulator

Brain-computer interface holds potential for training

Human-in-the-Loop Simulations effective in air traffic evaluation

Computer simulation of real earthquakes available for worldwide network

Dust model paints alien's view

Students to participate in 19th Annual Future City Competition

DoD MSSOC course enrollment open for 2011

M&S Journal accepting technical papers

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MSIAC EXHIBITS AT THE 2010 I/ITSEC AS A VALUABLE PARTNER AT THE M&S CO BOOTH

The Modeling and Simulation Information Analysis Center (MSIAC) is a DoD-chartered technical resource center providing information on M&S policy, practice, technology, and applications. Acting as *Your GPS for M&S*™, we offer *help*, and can *find*, *share*, and *confirm* M&S information. Our quality support is based on understanding the M&S community's needs, an extensive M&S knowledge base, and our experience in technological and operational solutions. Come visit us in Booth 416 where we are exhibiting as a valuable partner of the Modeling and Simulation Coordination Office (M&S CO). Also, be sure to catch our presentation in the Innovation Showcase on Monday, November 29th, at 3:15 PM.

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The following article on the Department of Defense's Modeling and Simulation Information System (MSIS), was contributed by the MSIAC.

Modeling and Simulation Information System (MSIS) – Your M&S Information Source

The Department of Defense's Modeling and Simulation Information System, where you have DoD M&S resources at your fingertips

What's MSIS? MSIS is a valuable M&S informational repository supporting M&S activities within the Department. Modeling and Simulation Information System (MSIS), the next iteration of improved capabilities from the MSRR, is a world-wide distributed network of Modeling and Simulation (M&S) resources

organized by categories and updated by the resource owners. The types of resources found in MSIS are models, simulations, tools, utilities, documents, data sources, and databases. The MSIS currently contains over 3200, M&S metadata references – one of the largest in the Department of Defense.

What's the benefit of using MSIS? *MSIS offers you a ready reference source for M&S information.* It provides an unlimited reuse potential at your fingertips and registered users are offered immediate access to all resources. MSIS enables discovery and delivery of modeling and simulation resource descriptions used by Department of Defense organizations. The controls and navigation methods for MSIS provide, through a single entry point, an efficient means for locating and accessing a variety of significant M&S resources.

What's in it for you? *MSIS is a time saving and visibility tool for M&S information.* MSIS is a great asset for providing visibility to your M&S resource or project. MSIS is also a time saving tool as your direct conduit to the new DoD M&S Catalog. MSIS metadata is uplinked on a regular basis directly into the M&S Catalog, providing you with opportunities to connect your models, simulations, tools, utilities, documents, data sources, and databases, ideas and practices across the DoD M&S network.

What's the benefit of updating your resources? *Updated information to MSIS is shared across the DoD network of M&S resources.* Users of MSIS and M&S Catalog are seeking the most current M&S technologies and have limited time to find what they are looking for. MSIS is a valuable tool for discovering and reusing existing tools, gaining knowledge of new and cutting-edge technologies, saving research time, and promoting your organization's M&S initiatives. So don't wait, update.

Is there more? *MSIS is a link to experts, events and ideas.* Providing collateral support to MSIS is the MSIAC Help Desk. The MSIAC Help Desk is a live expert link for those searching for specific M&S information and access to M&S resources. Also, MSIS's "What's New" page provides global M&S announcements and updates, and access to both the MSIAC M&S Calendar, and the DoD's premier M&S Journal.

What's next? You've spoken, we've heard you. We have received your input on providing "Best Practices", "How To," and "M&S Strategies" along with the metadata you need, and now we want to hear more from you. In the future, we anticipate including networking tools to MSIS that provide a vibrant forum for *your* voice. User feedback within MSIS will ensure that more robust, tailored, and relevant information is available for the trainer, the planner, the analyst…and the Warfighter! By augmenting MSIS with additional Operational Help Desk capabilities, such as a "Post Your Problem" discussion board and an "Updated Data Scroll", our goal is to provide improved tools that enable you to quickly find what you want, know how to retrieve it, and promote the technologies you've developed.

To register for MSIS click on the following link: http://msis.dod-msiac.org/MSIS.

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The following article on the Defense M&S group being added to the 2010 DAS, originally appeared in the September 2010 Phalanx issue.

DEFENSE M&S GROUP ADDED TO 2010 DAS

In the June 2010 issue of *PHALANX*, Dr. Tom Allen, Deputy Director for Force Management on the Joint Staff (J8/WAD), reported on the success of the Defense Analysis Seminar (DAS) held in the Republic of Korea (ROK) April 12-15, 2010. In that article, Dr. Allen mentioned that, for the first time in DAS history, Defense Modeling and Simulation (DM&S) was included as a member group in the main seminar; previously it met separately after the DAS. While Dr. Allen's article addressed the seminar in general, this provides more depth on the Modeling and Simulation groups.

To give the reader some perspective on the event, the DAS is biennial conference, jointly hosted by the Korea Institute for Defense Analyses (KIDA) and the U.S. Army Center for Army Analysis (CAA). Conducted at KIDA's Headquarters in Seoul, Korea, the seminar's purpose is to share operations research activities. This was the 15th DAS which was first held in 1979.

For the first time, classified presentations and discussions between the two longtime allies were permitted, which greatly enriched all of the seminar sessions.

In his keynote address, the Commander of U.S. Forces in Korea, General Walter Sharp, stated that the transfer of primary responsibility from US to ROK forces, for security of the Korean peninsula—which was recently delayed, by mutual agreement, from 2012 to 2015—would not mean a cut in the number of US forces in Korea or a diminishing US interest in mutual defense of the peninsula. He also presented a number of challenges to the attendees, including how to measure changes in war fighting readiness and risk as it pertains to deterrence.

The Defense Modeling & Simulation (DM&S) group attempted to address these challenges and many others. Mr. Jim Bexfield from the Office of the Undersecretary of Defense, Cost Assessment and Program Evaluation (OSD/CAPE) and Dr. Hyung-Kon Moon from KIDA co-chaired the DM&S session which presented 14 papers (8 US; 6 ROK).

Presentations addressed U.S. and ROK M&S interoperability issues, plans, and the Live-Virtual-Constructive (LVC) environment needed to support exercises after OPCON Transfer, now planned for the end of calendar year 2015. Other high-interest topic areas covered during the DM&S session, and shared with the other DAS attendees at the closing ceremony, included U.S. and ROK shared modeling concepts in the areas of ballistic missile defense, munitions expenditures and unexploded ordinance, refugee behavior and needs, weapons of mass destruction, distributed mission operations and training, effects analysis in attacks against chemical and biological facilities, and the evaluation of alternative simulators.

Key to the sharing of information, the DM&S group received presentations on and discussed ways of making M&S more visible and accessible through a cataloging system, and the importance of Data Exchange Agreements to enhance US-ROK cooperation.

Both ROK and U.S. participants and leaders agreed the DM&S group provided valuable insights, met desired objectives, and was an excellent venue for cooperative research exchange, offering an on-going opportunity to apply scientific knowledge and expertise to issues of mutual concern. Both nations look forward to continued, meaningful interactions as we approach DAS XVI which will be held in the April-May of 2012.

For the original article in Phalanx, September 2010 issue, click here.

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The following article on the US government inviting the public to solve challenges through a new website, originally appeared on the Department of Defense's website.

GOVERNMENT INVITES PUBLIC TO SOLVE CHALLENGES

WASHINGTON, Sept. 9, 2010 – The federal government has a lot of problems to solve, and a new website it launched this week will give average citizens a forum to discuss and potentially solve those problems while vying for rewards for the best solutions.

Bev Godwin, director of the U.S. General Services Administration's Center for New Media and Citizen Engagement; Brandon Kessler, founder and CEO of ChallengePost; and Tami Griffith, science and technology manager for the U.S. Army Research Laboratory's Simulation

and Training Technology Center, discussed the new site -- Challenge.gov -- during a “DoD Live” bloggers roundtable yesterday.

Godwin oversees the site for the government. Kessler’s company designs and builds “challenge” sites for different clients. Challenge.gov is an extension of President Barack Obama’s Strategy for American Innovation, which opens government solutions to the general public.

“Challenges and prizes can really change the way government in our country works, as it allows the government to bring new players to the table, to look at new ways to solve problems that can lead to new discoveries or new industries,” Godwin said. “It also provides the government a way to only pay for results. It also allows government a way to set forth a goal and let others decide how best to reach that goal.” Entrepreneurs, leading innovators and citizen solvers can compete for prizes on Challenge.gov by providing solutions to tough problems.

“The whole concept behind the platform is that if you have a centralized network around challenges, more people will interact with multiple challenges,” Kessler said. “We see, in fact, that people who engage in one challenge tend to engage in multiple challenges, because they’re connected to a network.”

For the complete article from the U.S. Department of Defense, click here.

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The following article on the largest simulated cyber attack in DHS history, originally appeared on the Help Net Security website.

LARGEST SIMULATED CYBER ATTACK TO DATE

In order to test the National Cyber Incident Response Plan and the new National Cybersecurity and Communications Integration Center, the Department of Homeland Security (DHS) will hold the largest simulated cyber attack to date.

Named Cyber Storm III, the exercise is supposed to start today and last three or four days - depending on the response to the "attack". A complex but dynamic scenario that will be changing according to the various actions and decisions the players should provide a realistic assessment of the defensive capabilities that federal departments, intelligence agencies, private sector companies, various states and international partners can mobilize in the time of need.

Brett Lambo, director of DHS' National Cyber Security Division's cyber exercise program hopes that this test will reveal all the weak links in the response process, and whether the things they plan on doing constitute the right way to go about the business of national cyber defense.

"The point of an exercise like this is to lay yourself bare a little bit and get to the point where you break certain things," he revealed to Information Week.

Another goal of this exercise is to see if the government and the private sector (especially those companies that manage critical infrastructure) can work together towards the common goal of keeping systems running.

Cyber Storm III participants, located in their real-world offices, will be receiving information and tools from the Secret Service headquarters. The information will be including fake log data and event history, and the tools might take form of drives infected with malware. Of course, many details about the exercise must remain secret until the very end, so that the players don't form any expectations about its course.

The scenario has been developed to reflect the various possibilities and evolving threats that characterize today's cyber world. According to Lambo, the threats will not affect only uptime but also integrity. "We’re trying to upset the chain of

trust. We're basically using the Internet against itself," he said.

For the original article from Help Net Security, click here.

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The following article on submarine crews learning virtual mariner skills, originally appeared in the National Defense Magazine.

SUBMARINE CREWS WILL LEARN NAVIGATION, MARINER SKILLS IN SIMULATORS

GROTON, Conn. — The Navy is looking to buy a virtual submarine bridge trainer to teach crews navigation and mariner skills.

The Naval Undersea Warfare Center in Newport, R.I., developed a submarine bridge trainer prototype that immerses crews in a simulated environment viewed from the top of a submarine's flying sail or bridge.

"You open the door, you walk in, you're standing on a bridge pedestal inside of a sphere, looking 360 degrees," said Capt. Kenneth Swan, commanding officer of the submarine learning center, which oversees the Navy's undersea warfare training. "There could be five of us in there training as if we were on the bridge, versus one person wearing the helmet doing virtual reality."

At submarine schools today students typically do most of their learning after the fact during a walk-through reconstruction of the scenario with an instructor.

For the original article from the National Defense Magazine, click here.

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The following article on brain-computer interface for potential training, originally appeared on the Training Simulation Journal (TSJ) website.

THOUGHT CONTROL
Brain-computer interface holds potential for realistic training

Back in 1982, when the coolest Apple gadget was an Apple II computer glowing in glorious monochrome green, there was a movie called "Firefox." Clint Eastwood played — as only Clint Eastwood could — a crazy, two-fisted American pilot who steals an experimental Soviet fighter. But the real star of the movie was the Firefox, a Soviet jet armed with thought-controlled weapons.

Twenty-eight years later and thought-controlled aircraft are as elusive as action heroes who can act. But thought control is coming. Slowly, tentatively, Army researchers are beginning to explore how to use human thoughts to control avatars in training simulations. Instead of hitting a keyboard or struggling with a joystick, a user would control a mechanical device or command an avatar in a computer game just by thinking.

The technology is called a brain-computer interface (BCI). Basically, when you want to move your arm or turn your head, your brain generates electrical impulses in a specific neural signature. That signature can be detected by special sensors, and then translated into commands that can be understood by a computer. Instead of using a keyboard, your brain becomes the keyboard.

BCI has been used by monkeys to move robotic arms, as well as by humans who are blind or paraplegic. However, these have been invasive systems that are implanted directly into the brain, which could prove a bit of a morale problem for soldiers who object to their skulls being punctured. But noninvasive BCI, which is worn like a headset, has hit the market. It's aimed at video gamers who want their hands to be free.

Researchers have been experimenting with BCI at the U.S. Army's Simulation & Training Technology Center (STTC) in Orlando, Fla. Nothing fancy — just $2,000 in equipment and a couple of researchers working in their spare time. But already they have been able to thought-control their avatars in the "Second Life" online world, said Tami Griffith, STTC's science and technology manager for virtual world and game-based training.

Griffith uses the Emagin Z800 head-mounted display (HMD) for turning her avatar, which she performs by moving her head left or right. Moving the avatar forward and backward is done via an Emotiv EPOC BCI headset. (You can see a video at www.youtube.com/user/STTCResearch).

For the complete article from TSJ Online, click here.

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The following article on Human-in-the-Loop simulations being effective in air traffic evaluations, originally appeared on the NASA Aviation Systems Division website.

TERMINAL AREA PRECISION SCHEDULING SYSTEM (TAPSS) TEAM COMPLETES 4 WEEKS OF HUMAN-IN-THE-LOOP SIMULATIONS

Four weeks of Human-in-the-Loop simulations evaluating terminal area scheduling decision support tools were completed in September 2010. The simulations helped in the evaluation of the concept of precision metering with staged delay distribution to account for uncertainty within the system and also investigated environmentally-friendly, or "green" procedures in high-density airspace.

The simulation focused on traffic arriving at Los Angeles International Airport (LAX), a single high-flow airport, in a complex Metroplex airspace within the Southern California terminal radar approach control (TRACON). Controllers staffed three Air Route Traffic Control Center arrival-metering sectors, three TRACON Feeder Positions and two Final Positions. Initial results using the TAPSS decision support tools showed close to a 20% increase in airport throughput when using more fuel-efficient aircraft maneuvers, and lower controller workload when compared to current-day airport operations.

In the first two-week period, specific features of the decision support tools were evaluated, and results compared well with previous Monte-Carlo analytical simulations that were used for the scheduling and controller tool design. In the second two-week period, today's arrival LAX operations were compared to the TAPSS tool-enhanced environment.

The demand on the airport was varied from current day levels to anticipated traffic levels in 2020. The simulation was demonstrated to senior FAA managers, the NASA Advisory Committee, and the NASA Administrator.

For the original article and more news from NASA Aviation Systems Division, click here.

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The following article on a computer simulating earthquake for the worldwide network, originally appeared on the ScienceDaily website.

COMPUTER SIMULATION OF REAL EARTHQUAKES MADE AVAILABLE TO WORLDWIDE NETWORK

ScienceDaily (Sep. 24, 2010) — A Princeton University-led research team has developed the capability to produce realistic movies of earthquakes based on complex computer simulations that can be made available worldwide within hours of a disastrous upheaval.

The videos show waves of ground motion spreading out from an epicenter. In making them widely available, the team of computational seismologists and computer scientists aims to aid researchers working to improve

understanding of earthquakes and develop better maps of the Earth's interior.

"In our view, this could truly change seismic science," said Princeton's Jeroen Tromp, a professor of geosciences and applied and computational mathematics, who led the effort.

"The better we understand what happens during earthquakes, the better prepared we can be. In addition, advances in understanding seismic waves can aid basic science efforts, helping us understand the underlying physics at work in the Earth's interior. These visualizations, we believe, will add greatly to the research effort."

In a scientific paper describing the system, which appeared online Sept. 16 and will be published in the Oct. 2010 Geophysical Journal International, the team describes how it creates the videos. The movies will be made available for free to scientists and members of the public and news organizations interested in featuring such images on television and the Internet. The easily downloadable videos can be viewed at: global.shakemovie.princeton.edu.

They tell the story in a language that is easy to understand, said Tromp, who also is the director of the Princeton Institute for Computational Science and Engineering (PICSciE).

When an earthquake takes place, data from seismograms measuring ground motion are collected by a worldwide network of more than 1,800 seismographic stations operated by members of the international Federation of Digital Seismograph Networks. The earthquake's location, depth and intensity also are determined. The ShakeMovie system at Princeton will now collect these recordings automatically using the Internet.

For the complete article from ScienceDaily, click here.

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The following article on a dust model painting a view of the solar system, originally appeared on the NASA website.

DUST MODEL PAINTS ALIEN'S VIEW OF SOLAR SYSTEM

New supercomputer simulations tracking the interactions of thousands of dust grains show what the solar system might look like to alien astronomers searching for planets. The models also provide a glimpse of how this view might have changed as our planetary system matured.

"The planets may be too dim to detect directly, but aliens studying the solar system could easily determine the presence of Neptune -- its gravity carves a little gap in the dust," said Marc Kuchner, an astrophysicist at NASA's Goddard Space Flight Center in Greenbelt, MD. who led the study. "We're hoping our models will help us spot Neptune-sized worlds around other stars."

The dust originates in the Kuiper Belt, a cold-storage zone beyond Neptune where millions of icy bodies -- including Pluto -- orbit the sun. Scientists believe the region is an older, leaner version of the debris disks they've seen around stars like Vega and Fomalhaut.

"Our new simulations also allow us to see how dust from the Kuiper Belt might have looked when the solar system was much younger," said Christopher Stark, who worked with Kuchner at NASA Goddard and is now at the Carnegie Institution for Science in Washington, D.C. "In effect, we can go back in time and see how the distant view of the solar system may have changed."

Kuiper Belt objects occasionally crash into each other, and this relentless bump-and-grind produces a flurry of icy grains. But tracking how this dust travels through the solar system isn't easy because small particles are subject to a variety of forces in addition to the gravitational pull of the sun and planets.

The grains are affected by the solar wind, which

works to bring dust closer to the sun, and sunlight, which can either pull dust inward or push it outward. Exactly what happens depends on the size of the grain.

The particles also run into each other, and these collisions can destroy the fragile grains. A paper on the new models, which are the first to include collisions among grains, appeared in the Sept. 7 edition of The Astronomical Journal.

"People felt that the collision calculation couldn't be done because there are just too many of these tiny grains too keep track of," Kuchner said. "We found a way to do it, and that has opened up a whole new landscape."

For the complete article from NASA, click here.

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The following article on the 19th Annual Future City Competition, was contributed by Future City Hampton Roads.

NATIONAL ENGINEERS WEEK FOUNDATION 19th ANNUAL FUTURE CITY® COMPETITION

Students from the Hampton Roads and surrounding areas along with those from nearly 40 other regions across the country to be tasked with engineering, designing and developing virtual and on-site health care systems for clinics and hospitals of future generations

HAMPTON ROADS, VA – Engineers have long played a vital role in improving the quality of healthcare by conceptualizing, innovating and implementing ground-breaking infrastructure, delivery systems, technologies, devices and products. Starting this fall, Hampton Roads and surrounding area middle schoolers participating in National Engineers Week Foundation's 2010-11 Future City® Competition will be asked to serve as engineering leaders and design a product or system that supports and sustains the healthy living and wellness programs that doctors, nurses, patients, elected officials and ordinary citizens in generations to come will demand for their communities.
Students start with a research essay describing their concept, which this year is themed Providing a Reliable and Effective Health Care Product or System That Improves a Sick, Injured or Disabled Patient's Quality of Life and Comfort. Students will also write a City Narrative outlining the key features of their city.

As they envision the medical centers, clinics and hospitals of the future, students will also propose, design and develop the supporting infrastructure – both virtual and physical – that would be integral to those facilities. Participating students will use SimCity 4 Deluxe software to design a virtual Future City model incorporating their ideas. Then they will build a physical model using recycled materials.

The 19th Annual Future City Competition, for sixth, seventh and eighth grade students, is held from September, 2010 through February, 2011.

For Future City Hampton Roads Information, visit www.futurecityhamptonroads.org.

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DoD MSSOC course enrollment open for 2011.

DoD MODELING AND SIMULATION STAFF OFFICER COURSE (MSSOC) 2011

25-27	*Jan*	*Alexandria, VA*
1-3	*Mar*	*Orlando, FL*
5-7	*April*	*Newport News, VA*
17-19	*May*	*Wright-Patterson AFB, OH*

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.

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.

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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The Modeling and Simulation Information Analysis Center (MSIAC) M&S Newsletter is now available as an automatic service. Simply send an email to digest-subscribe@lists.dod-msiac.org to be added to our mailing list. This list is for the Newsletter only and will not be used for any other purpose. Please note that it is not necessary to subscribe each month.

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.

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 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.