



Welcome to the August/September 2008 edition of the Modeling and Simulation Information Analysis Center (MSIAC) M&S Newsletter. In this issue you will find 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 August/September edition and look forward to your comments.

The MSIAC notes that the wordings in the excerpts do not always correspond to official DoD usage, but that the full articles available through the links provide valuable insight into the applications of M&S technologies throughout the community.

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The following excerpt of an article about standards originally appeared in the Training & Simulation Journal (TSJ) Online, September 2008 issue.

STANDARDS WORTH KEEPING

DoD hopes database of protocols, interfaces will boost interoperability effort

In an effort that has been widely described as a good first step, the U.S. Defense Department Modeling and Simulation Coordination Office has completed the first database of standards, interfaces and protocols used by the defense modeling and simulation community. After an industry wide call for data, the office has completed and posted a searchable version of the database for use by approved government contractors and those in the defense modeling and simulation management system.

It's an attempt to address two major issues that have plagued the Pentagon for years, officials say: interoperability and the high cost associated with having to continually purchase similar M&S components. Without standards — documents that establish uniform engineering or technical criteria, processes, and practices — the industry has struggled to make progress toward a greater goal of systems interoperability. Interfaces are defined as the functional and physical characteristics required to

exist at a common boundary or connection between systems or items. Protocols are defined as the behavior of a hardware connection.

"This will be used to help scope the effort going forward on M&S standards," said Bruce Bailey, associate director of the M&S Coordination Office. "It will be used as a primary reference for determining what modeling and simulation standards and protocols will be needed, and what profiles would be appropriate in an M&S [information technology] standards program. It will also be used as a baseline for establishing what needs to be done going forward to keep M&S standards as a priority."

The project is part of an overarching plan to develop a net-centric M&S environment, headed by the Defense Department Modeling and Simulation Steering Committee, which is working actively to encourage interoperability and reuse. End users say the database is an important first step toward simplifying the way they do business.

"This is a reasonably significant initiative," said Rick Severinghaus, executive committee chairman of the independent Simulation Interoperability Standards Organization (SISO). "To the extent that industry and DoD are of the same mind and intent with respect to use of standards, it can benefit both."

For standards "commonly" in use, he said, the Defense Department can now specify their use in acquisition and other requirements. As for industry, vendors may be better able to judge what is best to use in developing various products and processes of known or potential interest and value to military customers. The result on both sides is the potential for significant savings. "The value of standards to DoD activities lies in the potential to save time, energy and resources in developing and implementing products, services, processes and infrastructure," Severinghaus said. For complete article from Training & Simulation Journal (TSJ) Online, click [here](#).

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The following article about the passage of a modeling and simulation Bill, originally appeared in the Modeling and Simulation Caucus Newsletter, September 2008 issue.

MEMBERS OF THE MODELING AND SIMULATION CAUCUS ANNOUNCE PASSAGE OF M&S BILL

Members of the Congressional Modeling and Simulation Caucus held a press conference on August 19th at the Virginia Modeling, Analysis and Simulation Center (VMASC) in Suffolk to announce key movement on a grant program that will encourage the study of modeling and simulation (M&S) at institutions of higher education. Introduced by Congressman Bobby Scott (VA-03), H.R. 4165, was included in the Higher Education Act, H.R. 4137, signed into law by the President on August 14, 2008. Congressman Scott is one of the original members of the M&S Caucus.

Currently, a limited number of institutions of higher education have Modeling and Simulation programs, including undergraduate and graduate degree programs. This competitive grant program is divided into two portions. The first will provide a critical source of funding for colleges and universities that want to expand and improve their Modeling and Simulation programs. The second grant portion will provide seed money for colleges and universities that do not have an M&S program, but wish to establish one for the first time.

Modeling and simulation has been responsible for the progressive developments in the defense industry, health care, homeland security, construction and transportation. Other Members of the M&S Caucus who cosponsored this legislation are Chairman Rep. Randy Forbes (VA-04), co-Chairman Rep. Solomon Ortiz (TX-27), Rep. Thelma Drake (VA-02), Rep. Tom Feeney (FL-24), and Rep. Ric Keller (FL-08). For original article from the M&S Caucus Newsletter, click [here](#).

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The following excerpt of an article about an Army virtual reality center appeared on Military.com.

ARMY OPENS VIRTUAL REALITY CENTER

Across from the skate park at Franklin Mills Mall, the Army has opened a high-tech recruiting experiment to give potential sign-ups a taste of what military life is like.

The 14,500-square-foot Army Experience Center features Disney-grade simulators that immerse visitors in missions aboard helicopters or a humvee. Visitors are briefed on their missions at the tactical operations center (TOC), which looks like a set from a Tom Clancy thriller.

Banks of Xbox 360s with plush chairs include speakers in the headrests. Participants can play popular "shooter" games such as Call of Duty 3, or kick back and just play Madden 09 football.

As younger generations become increasingly tech-savvy and their habits and routines change, Army recruitment strategies are changing as well.

"You can come in here and be put in the life of a soldier," said Amy Lindstrom, who handled public relations for yesterday's opening.

Large touch-screen displays explain the more than 150 job types in the Army. One display uses Google Earth to identify Army bases around the world, and has narration that explains the type of recreation and dining outside each base.

Part of the strategy is to encourage passive recruitment. For example, the "Career Configurator" station lets people learn about jobs in the Army. They can touch the "contact a recruiter" button on the screen, and a name, address, phone number and e-mail address for a recruiter pops up. If they want, they then may leave.

"Without talking to somebody, they can learn on their own," said Maj. Larry Dillard, project manager for the new center.





Since younger people are spending more time playing video games or on the Internet, "what we did was, we got into their territory," said Cianchetti.

There are also a few things they can't get at home.

The standout attractions are the simulators of the UH-60 Black Hawk, the AH-64 Apache and the HMMWV, or humvee.

The Black Hawk simulator allows a visitor to sit in a gunner position as the helicopter flies above a convoy through hostile mountainous terrain. Once the mission begins, giant video screens encompass a player's vision with the battlefield. The Black Hawk vibrates and fans blow air to replicate the sensation of flying with the doors open.

It's realistic enough to be disorienting. For complete article from Military.com, click [here](#).

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The following excerpt of an article about Army scientists, originally appeared in the National Defense Magazine, October 2008 issue.

ARMY SCIENTISTS IN PURSUIT OF THE EXTRAORDINARY

Combat uniforms made of light fabrics that are tougher than steel ... Batteries that last for days and fit in tiny pockets ... Bug-sized lasers that prevent fratricide and also function as voice radios ... Short of calling Wayne Enterprises, it is unclear how and when the Army will turn these high-tech dreams into reality.

But it may not be as hard as most people might think, according to Army scientists. The Army's laboratories are actively partnering with universities and the private sector in hopes that soldiers one day can go to war with equipment that now only exists in superhero movies.

"We create the future for our soldiers, and we do that through strategic planning and investment in areas

that we believe will provide our soldiers with extraordinary capabilities," says John A. Parmentola, the Army's director for research and laboratory management.

Many of the latest projects are directly influenced by the lessons of war, Parmentola says. "We've learned, I think, quite a bit from this recent engagement in Iraq."

Science has much to offer toward soldier protection, for example. "We're trying to develop new fabrics" that could make combat uniforms tough as steel, Parmentola says. The answer is in nanotechnology.

At the Institute for Soldier Nanotechnologies, scientists are trying to grow single carbon nanotubes to about a foot in length. "Once we start getting them in length, the hope is that we'll be able to spin them into fabric," he says.

Carbon nanotubes — molecular-scale tubes of graphitic carbon — can be about 200 times the strength of steel at one-tenth of the mass, says Parmentola. They also have extraordinary conductive and thermal properties.

In addition to technologies that are aimed at improving soldier equipment, Army laboratories are being asked to figure out better ways to train troops.

"One of the most important ones for our future is neuroscience — understanding how the brain works and how we can improve our ability to train our soldiers," says Parmentola.

The goal is to help the Army tailor training programs to best take advantage of individual learning abilities. Some people, for instance, learn better through visualization and others comprehend more through hearing.

This project is only in the early stages and most of the details have yet to be worked out, Parmentola says. Traditionally the Army has opted for a one-size-fits-all approach to training, "but that doesn't maximize the individual performance because each one learns differently," he says. "There is a





tremendous amount to be gained by having soldiers with the requisite skills.”

One option is to design “immersive training environments” with “intelligent tutors” embedded that describe the skill level of the ideal soldier. These technologies already exist in the videogame industry. “As the soldier trains, the system measures the rate at which he learns. The system [then] adjusts to the skill level of the soldier,” says Parmentola.

The intelligent tutors are being developed by neurologists at the University of California at Santa Barbara.

Virtual simulations that are based on neuroscience also could be used to treat soldiers who suffer from post-traumatic stress disorder. As many as 15 percent of all soldiers return from war with symptoms of PTSD. “It’s a neurological problem that we fundamentally don’t understand,” he says. “We are finding that methods — such as immersive environments — that have been used traditionally to cure people of phobias help decrease the symptoms of PTSD.” For complete article from National Defense Magazine, click [here](#).

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The following article about virtual reality and UAVs, originally appeared on the Wright-Patterson Air Force base website.

IOWA STATE’S VIRTUAL REALITY PROJECT IMPACTS OPERATION OF UNMANNED AERIAL VEHICLES

(9/18/2008 - Arlington, Va.) - An Air Force Office of Scientific Research (AFOSR)-managed research team is building a virtual reality (VR) environment for the battlespace initiative so the full potential of Unmanned Aerial Vehicles (UAVs) can be achieved.

“We are applying advanced physical and eye-tracking systems and voice interfaces. Our goal is to provide role specific interfaces for a team and shared situational awareness using a large display,” said lead researcher, Dr. James Oliver.

Dr. Oliver and his colleagues are first trying to solve significant human interface issues arising from limitations affecting operators who control UAVs from the ground. They are also designing and testing the hardware, software and aeronautical systems to create immersive ground control stations based on VR technology.

“We are using a virtual environment of the battleground as the primary interface context, with the variety of information sources available in a modern military engagement,” said Dr. Oliver. “We are also developing and measuring the effectiveness of new human interface techniques to enable operators to effectively control multiple, semi-autonomous aircraft. Already, up to 230 persons can be interfaced to participate in the system simultaneously,” he said.

The VR environment uses a 3-D audiovisual stereoscopic facility, with six walls, 24 projectors, ultrasonic motion tracking, eight-channel audio and a graphics computer. The context has many benefits including large field of view and innovative information representation.

The VR environment will enable participants to see the vehicles, the surrounding airspace and the terrain they are flying over as well as information from instruments, cameras, radar and weapons systems. This approach can solve the critical operational and training challenges that must be overcome to allow an operator to simultaneously monitor and control several UAVs at the same time.

“We are also exploring new ways to employ VR to address the challenge of time lag that is characteristic of applications where machines are operated at a distance,” he said.

Last spring the researchers convened a scientific advisory panel of experts in the field and received outstanding feedback because their research has now begun to focus on human effectiveness. For original article from Wright-Patterson Air Force Base, click [here](#).

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The following article about an air space simulation, originally appeared on the NASA website.

VERY-CLOSELY SPACED PARALLEL RUNWAY APPROACHES II SIMULATION

A simulation study to investigate off-nominal information requirements and procedures for very-closely-spaced parallel runway approaches was completed August 8, 2008.

The study represented a joint effort between NASA and the Raytheon Corporation and supports a milestone within the NextGen Airspace Project's Airspace Super Density Operations research focus area. New procedures, display features, and alerting algorithms were incorporated within the Advanced Concept Flight Simulator at NASA Ames.

Eight retired commercial pilots participated in a series of 24 short flight scenarios. The scenarios involved three aircraft on approach to three very-closely-spaced parallel runways (750 feet between centerlines). The three aircraft flew an echelon with the simulator participants flying as either the center or the trailing aircraft in the series.

Two-thirds of the flight scenarios included off-nominal events where the encroachment of another aircraft, or another aircraft's wake, required a break-out maneuver from the pilot participant. The data collected included workload, situation awareness, and aircraft navigation performance data. The data will be used to develop guidelines for information requirements and procedures for three very-closely-spaced parallel approaches, under nominal and off-nominal conditions. For original article from NASA, click [here](#).

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EMBRY-RIDDLE AERONAUTICAL UNIVERSITY OFFERS ONLINE MODELING AND SIMULATION CERTIFICATE PROGRAM

Daytona Beach, FL – October 1, 2008 – Embry-Riddle Aeronautical University Worldwide (ERAU) offers a set of online courses to train military and business users on the uses and benefits of modeling

and simulation (M&S). These technologies are used in acquisition, training and operational activities to improve the efficiency and effectiveness of these activities.

The first course, "Introduction to Modeling and Simulation," has been offered since February and the program has now been expanded to include four more courses covering Acquisition, Test & Evaluation, High Level Architecture and 'Verification, Validation & Accreditation'. Completing all five courses will earn participants a Certificate in Modeling & Simulation from Embry-Riddle. This new M&S curriculum at Embry-Riddle covers the operation, engineering, research, testing, design, manufacturing, evaluation, application, marketing, validation, verification, accreditation and management of these new technologies with an emphasis on practical application. "What's unique about the modeling and simulation courses at Embry-Riddle is that they are being offered to technical and non-technical people, both within the Department of Defense and within industry, using the online environment for optimum convenience" said Dr. John Watret, Vice-Chancellor of Embry-Riddle's Worldwide campus.

"This expansion of our Modeling & Simulation program is a logical one. It is designed to parallel the growth of these technologies within industry," said Thorsten Hisam, Director of Embry-Riddle's Office of Professional Education. "The joint efforts of Embry-Riddle and its industry partners bring the best of industry knowledge together with world-class educational delivery."

Students can register for these courses via the Embry-Riddle Website at:

www.erau.edu/ec/soctapd/modeling-simulation.html

For upcoming M&S events please visit the [MSIAC Calendar Online](#).





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MSIAC M&S NEWSLETTER

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